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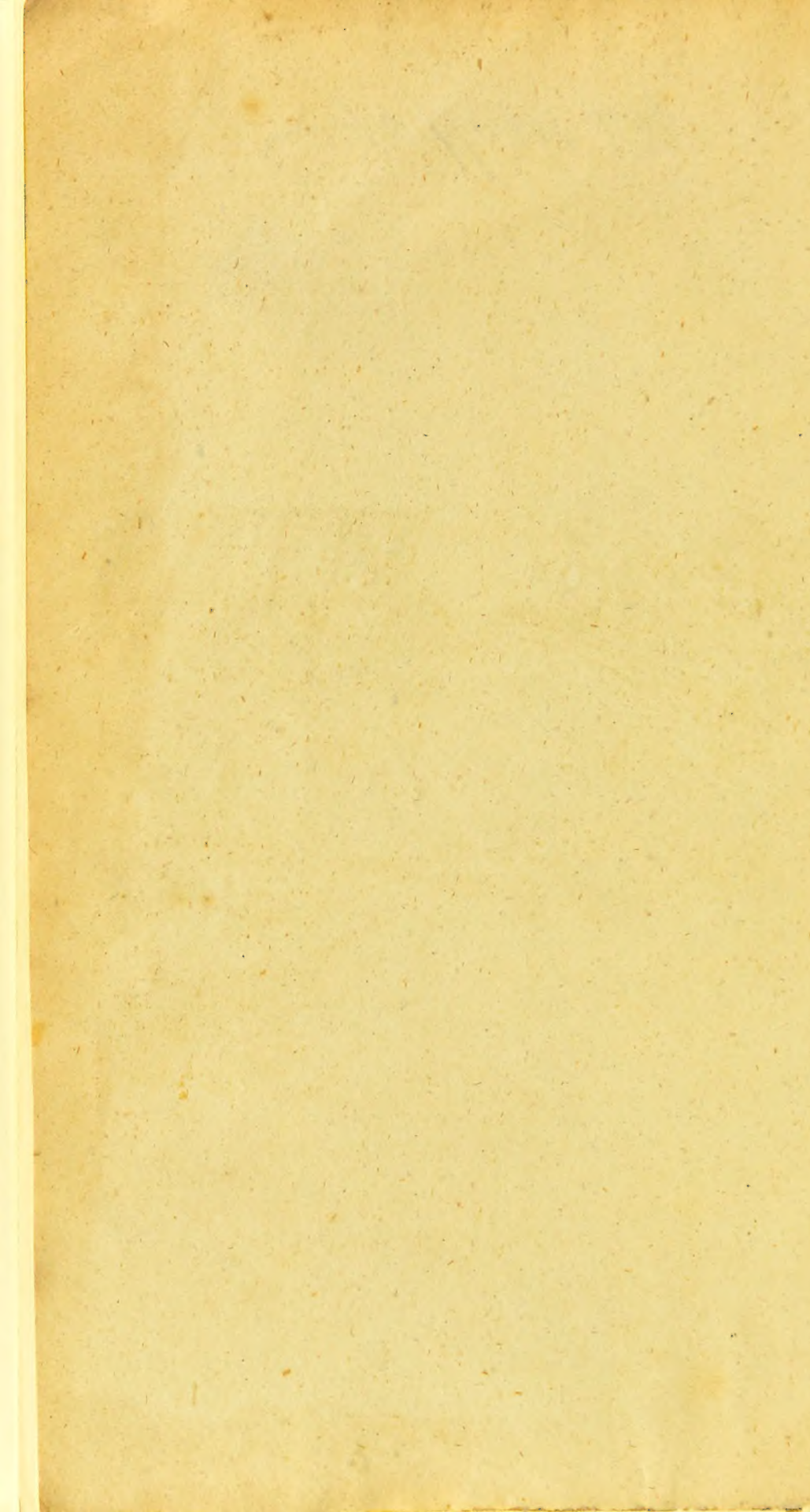


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REMARKS
ON
HYDROPHOBIA,
&c.



96

REMARKS
ON
HYDROPHOBIA;
OR THE
DISEASE
PRODUCED BY THE
BITE of a MAD DOG,
OR OTHER
RABID ANIMAL.

By ROBERT HAMILTON, M. D.

MEMBER OF THE ROYAL COLLEGE OF PHYSICIANS, LONDON;
OF THE ROYAL MEDICAL AND PHYSICAL SOCIETIES, EDINBURGH;
OF THE MEDICAL SOCIETY, LONDON;
AND LATE PHYSICIAN TO THE ARMY.

IN TWO VOLUMES.

THE SECOND EDITION, WITH ADDITIONS AND CORRECTIONS.

Morsu virus habent, et fatum dente mīnantur. LUCAN. PHARSAL.
Aliorum factis, nobis quod ex usu sit admonemur. CRATO.

VOL. II.

SOLD BY LONGMAN, PATERNOSTER ROW, LONDON.

1798.





TO THE READER.



THIS volume is extended by the Appendix annexed to a greater length than was at first intended ; but conceiving the various cases collected, arranged, epitomised, and brought into one point under the reader's view, to be not the least valuable part of the work, though at a considerable additional expence, I should have thought myself blameable not to have presented him with them. Should I be accused of diffuseness in other parts, my apology is much of the same kind ; I sacrifice my private interest to his accommodation.

I have endeavoured to offer something to three classes of readers ; the medical pathologist and practitioner already established, the student less advanced in study or in practice,
and

and those not following medicine as a profession, comprehending all who cultivate the canine breed, for field amusement, or domestic use. My theories he is at liberty to treat as he may think them to deserve; they are often, confessedly, imperfect, and sometimes hazarded merely to excite reflection in others; but to the facts adduced he will perhaps pay more deference.

Analogy I have called to my aid whenever it presented itself under any rational view, conceiving the more analogies that can be brought to support an argument, the more probability there will be in its favour; but I have inferred nothing certain, nor drawn from thence positive conclusions. If I have canvassed with freedom the opinions of respectable authors, it was with the intention to investigate, not to offend, nor captiously to contradict. The candid reader, I trust, will not accuse me of, but excuse errors or omissions, arising from inadvertency, or my particular situation, but not from negligence, or careless haste.

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CONTENTS of VOL. II.

	Page.
<i>Reflections on the Method of Cure, &c.</i>	
<i>Introduction</i>	1
<i>Division into two stages</i>	3
<i>Emetics</i>	5
<i>Cathartics</i>	9
<i>Injections</i>	12
<i>Bath, cold and warm</i>	14
<i>Sudorifics---Stimulants</i>	19
<i>Venesection</i>	27
<i>Reasons for rejecting it</i>	29
<i>Proof of non-existence of inflammation</i>	30
<i>Blisters---Rubefacients---Embrocations</i>	33
<i>Forcing the patient to drink injudicious, and often cruel</i>	38
<i>Mercury</i>	40
<i>Running as a means of relief considered</i>	44
<i>Application of cold</i>	47
<i>Ligatures</i>	48
<i>Extir-</i>	

	Page
<i>Extirpation of cicatrix at commencement of disease recommended</i>	49
<i>Oil</i>	52
<i>Examples of Oil unsuccessfully tried</i>	54 et seq.
<i>Vinegar</i>	61
<i>Hints respecting the superiority of the Oxalic to the Acetous Acid</i>	67
<i>Antispasmodics</i>	69
<i>Opium considered</i>	70
<i>Hydro-carbonate gas as antispasmodic</i>	72
<i>Tonics</i>	77
<i>Arsenic as tonic recommended</i>	79
<i>Tonic pill of Tanjore examined</i>	80
<i>Arsenic analyzed by Girtanner---supposed mode of action from thence</i>	84
<i>Hydro-carbonate gas from pathological considerations rejected</i>	86
<i>Its effects on reddening muscle, marrow, bone, &c.</i>	ibid
<i>Rendering blood red</i>	88
<i>Enquiry into the state of oxygenation in Hydrophobia</i>	90
<i>Some observations on the blood</i>	91
<i>Speedy putrefaction of Hydrophobic ca- davera</i>	95
<i>Vital air or oxygene recommended</i>	101
<i>Exhibition neither difficult nor dan- gerous</i>	110
<i>Exam-</i>	

	Page
<i>Examples</i>	111 et seq.
<i>Recapitulation</i>	118
<i>Probability of a cure in the first stage</i>	
<i>---incurable in the second</i>	118
<i>Hints respecting a hydro-carbonate bath</i>	126
<i>An assertion relative to the earlier or</i>	
<i>later commencement examined</i>	130
<i>Hydrophobia in man not madness, as</i>	
<i>usually styled; nor communicable</i>	
<i>by him---Not communicable by other</i>	
<i>classes of animals, the dog and cat</i>	
<i>excepted</i>	138
<i>Violent death in the human hydropho-</i>	
<i>bic unnecessary and cruel</i>	142
<i>Convulsive noise vulgarly called barking</i>	151
<i>Reflections on the remote cause in the</i>	
<i>canine tribe, &c.</i>	153
<i>Rabies excited by a certain combination</i>	
<i>of particles of matter internally in</i>	
<i>the animal, conjoined to external</i>	
<i>circumstances, climate, food, water,</i>	
<i>heat, cold, &c.</i>	158
<i>Infection, whether general or specific,</i>	
<i>originates in a somewhat similar man-</i>	
<i>ner</i>	161
<i>Origin of nitric acid, animal, not mine-</i>	
<i>ral, as has been believed</i>	169
<i>Pro-</i>	

	Page
<i>Production of gaseous oxyd---its baneful effects---is the matter of general contagion---by certain modifications becomes particular specific contagion</i>	- 171
<i>Heberden's opinion examined respecting the fatality of rigorous winters over mild---the general position admitted</i>	194
<i>Typhus originating from debility alone</i>	199
<i>Contagion of rabies occasionally extinct--- occasionally re-produced</i>	205
<i>Generated at any season, whether hot or cold</i>	207
<i>Cuticular formation and defect of perspirable pores in the canine tribe--- whether conducive to rabies examined</i>	210
<i>Salivary glands little, if at all, affected in rabid dog</i>	218
<i>Reflections on signs hitherto considered as distinguishing a rabid dog---Refutation by examples</i>	225
<i>Familiarity with strange dogs hazardous</i>	235
<i>A suspected dog to be chained, not killed</i>	236
<i>Liver of mad dog no antidote---this vulgar error reprobated</i>	240
<i>Opinion of the Occurrence of Hydrophobia at new or full moon refuted</i>	243
	<i>Some</i>

	Page
<i>Some rules for obviating infection in dogs, or dissipating it from infected places where they are kept</i> -	245
<i>Dogs to be restrained in the use of corrupted carrion</i> - - -	247
<i>Cooked farinacea recommended</i> -	250
<i>Dog bath recommended</i> -	258
<i>Improper diet of lap-dogs</i> - -	260
<i>Abuse of bathing lap-dogs---bad consequences---exemplified by a fact</i> -	261
<i>Quarantine recommended as preventive of infection</i> - - -	263
<i>Worming of dogs considered</i> -	265

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## APPENDIX.

|                                                                                                                    |     |
|--------------------------------------------------------------------------------------------------------------------|-----|
| <i>Letter from Dr. Girdlestone, Physician, at Yarmouth, Norfolk, to the Author</i>                                 | 276 |
| <i>Letter from Dr. Maclean, Physician at Sudbury, Suffolk, to the Author</i> -                                     | 292 |
| <i>Ten cases from correspondents not before published</i> - - -                                                    | 309 |
| <i>Letter from the late Mr. John Hunter, followed by cases published only in the former edition of this work</i> - | 349 |
| <i>Case</i>                                                                                                        |     |



|                                                                                                                                                            | Page  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| <i>Case of Hydrophobia without a wound,<br/>from the Memoirs of the Academy of<br/>Sciences of Sweden, for 1777</i>                                        | - 366 |
| <i>Cases epitomised from different Authors</i>                                                                                                             | 377   |
| <i>A short analysis of papers relative to<br/>Hydrophobia, in the Memoirs of the<br/>Royal Society of Medicine of Paris,<br/>part 2, for the year 1783</i> | - 481 |
| <i>Second letter from Dr. Girdlestone</i>                                                                                                                  | - 538 |
| <i>Postscript</i>                                                                                                                                          | - 544 |



REFLECTIONS ON THE METHOD OF  
CURE, AS HITHERTO PROSECUTED;  
WITH HINTS RESPECTING SOME  
NEW REMEDIES.



**I**N viewing an hydrophobic patient suffering under an exacerbation, the attention is naturally directed to the convulsions which torture him, the difficulty of deglutition, and the distress which he expresses at the sight, or even mention of a fluid, though his thirst at the same time be excessive. These, with his melancholy aspect, extreme restlessness, constant watchfulness, with other marks of debility and irritation lead the practitioner without hesitation to consider the complaint as seated principally in the nervous system. He flies

therefore to whatever he presumes may allay this inordinate action, or tend, even though remotely, to that effect. Hence emetics, cathartics, V. S. blisters, clysters, opiates, tonics, and every medicine of which he has either read or heard extolled for this purpose, are immediately called to his aid. With what success may be seen from the melancholy detail of cases, as fatal as they are numerous, which the experience of many centuries have recorded.

The time indeed for action is short; its longest period little more than a day or two; the disease most rapidly running its course, the symptoms hourly doubling their violence. The late period of the malady at which the physician is called is another source of serious misfortune. Had he been present at the commencement, the rapidity of the disorder would afford him too little time; what then can be expected from a few hours perhaps towards the close of the second or last stage? Placed in this dilemma, what can he do more than merely to cast, with the bye-standers, a look of commiseration on the hopeless sufferer, prepare the friends for the approaching catastrophe, or order some medicine, which, from the present

sent situation of things, though powerful in itself, he is conscious cannot for a moment arrest the fatal blow?

The disease divides itself into two stages; the first from the commencement to the symptom Hydrophobia; the second from this to death. During the latter no cure has ever been made: in the former it is not perhaps absolutely proved whether a cure *can*, or has been accomplished. Dr. Guthrie's patient<sup>a</sup> however comes so near a positive instance that I am inclined to admit it, at least as a prevention. This being apparently the commencement of the disease, it leads to hopes of a cure in the first stage, I trust, not ill founded. This is a discovery of the highest importance, and ought to serve in future to gain an earlier admission to medical advice.

Some have supposed the rabid virus not only to be weaker in one animal than in another, but weaker likewise at an earlier period of the animal's complaint than at a later. The different kinds, which have been observed in dogs, of *dumb*, as it has been called, and of *furious* madness, would seem

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<sup>a</sup> Vide vol. I. p. 136. Boy at Petersburg.

on the one hand to countenance this idea; while on the other, the animal's capability of communicating the infection at an early period before his health is discovered to be impaired, and while he is placid and playful as usual, would forbid us to repose on such an opinion. It is not necessary here to decide farther on this question. No prudent man will trust himself with a suspected animal, whether he be *dumb*, and apparently harmless, or otherwise. We go on then to a review of the principal means which are at present adopted for the removal of Hydrophobia.



1st. *EMETICS.*

THESE have been used as one of the first means of relief from an idea of bile in the stomach. Porracious matter has often been ejected. Some dissections have shown the gall bladder turgid with bile, but in others again it has been found empty; from which contradictory states the conclusion becomes uncertain.

As the body comes gradually into a state of disease, and the different functions are less perfectly performed by the previous derangement, the biliary organs must suffer with the rest. There may be an increased secretion from an increased irritation, and with this the quality of the bile itself be vitiated: there may be likewise spasmodic affections existing in the intestine near the entrance of the duct into the duodenum; these may unite in throwing the secreted fluid into the stomach, and then become a farther excitement to this organ,

gan, whereby the vomiting, which happens in some cases, is continued.<sup>b</sup>

Have we not reason to apprehend, that emetics in Hydrophobia cannot be productive of good effects? and have we not equal reason to conclude, where nervous sensibility and irritability prevail, which from the previous history of the malady we find existing to a degree unexampled in any other complaint, that such an additional irritation must greatly add to the evil? They cannot remove the poison from the habit, nor stop the progress of the ravages which dissections prove the stomach to have suffered. I am led from this to reject the practice as nugatory, if not hurtful.

In perusing dissections we observe indeed, in some of them, a thick coat of mucus adhering to the internal surface of the stomach and œsophagus, lining them almost completely.<sup>c</sup> It would appear that the troublesome phlegm constantly in the mouth owes its origin to this cause; but an emetic, if this be a presumed indication for its use, had it the power of removing

<sup>b</sup> Vide vol. 1, p. 214, for proof that vomiting forms a symptom of the disease. Many exceptions however exist.

<sup>c</sup> Vide Dundas's patient, Appendix.

moving the whole, would fail in its effect, because the increased irritation and consequent secretion would supply the discharge as fast as it was removed.

If they be given with a view of increasing absorption, a defect in this function does not appear proved; the small preternatural increase of fluid within the ventricles of the brain, and a trifling increase of halitus, once or twice found within the pericardium, are not sufficient to establish this indication.

If they be given to remove obstructions by the concussions that they occasion, or to promote a more regular distribution of circulating fluids through the different organs, they are ill calculated for the purpose. The very efforts intended to produce this effect may, with more probability, rupture tender parts than remove congestions within them.

Gangrened spots are present, as we have seen from dissections, not only on the liver and diaphragm, but on the lungs, especially in the *spontaneous* species; and in the *rabid* the stomach is covered with gangrened erysipelatous abrasions, arising from debilitating causes. In the brain marks of congestion in some instances have likewise been seen.

It

It must therefore be evident, that whatever would increase these effects will be detrimental: emetics must create this, and therefore, in my opinion, are inadmissible.



## 2nd. CATHARTICS.

TOWARDS the first accession of the disease, when nothing can be said to be present but a kind of indisposition, and general uneasiness over the system; when a slight creeping coldness hangs about the patient, and a night less refreshed by sleep has been passed, such as specifically marks no disease, yet forms the beginning of every one, a gentle cathartic may be useful to remove any feculencies present in the intestinal canal. So far a cathartic may be admissible.

I shall not here point out the particular substances to be used. If we choose at all we should not lose sight of the distinction of *active* and *lenient*. At a time when little nourishment can be digested; when the gastric juice is changed in its qualities, and rendered less fit for its primary purposes, drastic purges should be excluded.

The mucus follicles indeed are constantly discharging themselves upon the internal surface

face of the intestine, and fordes may be there collected; but I cannot think it either prudent or advantageous to apply too often irritating substances to evacuate this matter in any disease, much less in the present. Nature has wisely placed here this apparatus; the mucus produced defends these delicate parts. Without it the contact of substances passing through would abrade and vellicate the tender nervous fibrillæ so numerously arranged in them.

A pill of well-levigated *calomel*, which I do not consider as a rough medicine, or an infusion of *fenna*, may not be inferior to any other; or should the choice fall on castor oil, I see little to object.

Practitioners constantly recommend purgatives in this disease; and it may be greatly doubted, whether they have not carried them too far. A weak patient cannot bear the repetition of purges producing “six or more stools at a time;”<sup>d</sup> the debility thereby induced is too sudden, and too severely shocks the system. They tell us indeed the stools were extremely fœtid. This I readily believe; but  
I ap-

<sup>d</sup> Vide Hogg's case, and others, Appendix.

I apprehend the same would be found were they ever so often to repeat the cathartic.

The fœtor is an effect not the cause. We have found the stomach in a diseased condition; nor have the intestines been always free;\* let us therefore be careful not to aggravate them. It appears preferable for cleansing these passages to use injections.

\* Vide Dissections.

3<sup>rd</sup>. *INJECTIONS.*

THESE are indeed of more importance in this disease than the last mentioned remedy. By them we can cleanse the primæ viæ from fordes, or administer remedies. Nay, by them we may nourish the body; for this is the only safe medium through which nutriment can now be introduced; but should the sensibility of the intestines be rendered greater, we shall be almost shut out from the only means of attempting relief. For while this passage is left we can prevent, for a time, at least inanition, so far as to obviate fatal dissolution by hunger. We can, also, should it seem proper, introduce opiates, aromatics, tonics, or such other substances as may be presumed suitable to our purpose. By injections these may be retained and partly at least absorbed: exhibited by the stomach they are ejected, and an additional injury is produced.

We have found, in the history of the disease the morbid sensibility of touch increased

to



to an extreme degree over the whole frame, particularly in some instances about the anus. This renders it difficult to introduce an injection pipe ; for as soon as the anus is touched the sphincter contracts, and the whole body is thrown into convulsions. This takes place more especially towards the close of life. To obviate it I am acquainted with no means. This sensibility forms an essential and characteristic part of the disease, and to mitigate it no endeavours have hitherto been successful. This morbid sensibility, as far as respects the anus, is not however constant in every case. Both solids and liquids, food and medicine, are occasionally retained in the stomach, but seldom found to descend into the intestinal tube. Though this renders cathartics less necessary, yet it militates nothing against injections, whether for cleansing more effectually the rectum, or for administering medicinal substances through this channel.

4th. *BATH, COLD and WARM.*

COLD.

IN treating of the prophylactics the cold bath, one of these, was then mentioned as being used likewise for a means of cure. Celsus speaks of it in this light, and principally with a view to difficult deglutition, a symptom which, in his opinion, it was well adapted to overcome; but he built his hopes chiefly on the mode of application. He orders the patient to be suddenly plunged into, and held under water for some time, that his horror to the fluid might be overcome, the stricture opened, and thirst quenched.

In later times the same idea was revived, and we see it practised on an old man by Van Helmont; and later still in our own country; for only a few years ago Dr. Vaughan, baffled by every other means in a desperate case, turned his attention to the same practice as his last refuge.

A tub

Here a tub of cold water was procured, saturated with salt; into this the patient was plunged, and forcibly held under water for some time; he was then brought up, again re-plunged till he ceased struggling, and left them apprehensive of his being drowned. They wrapt him in a warm blanket and laid him in bed. He remained quiet for two hours; but the convulsions returned and soon proved fatal. We do not blame the doctor for attempting this remedy. It was a lost case, and he only practised what had been strenuously inculcated by high medical authority in ancient times. Under these circumstances however the cold bath offers a very feeble and doubtful aid, not even balancing the sufferings felt by the patient at the idea of plunging into a fluid, the very name or sight of which creates horror, and throws him into the severest convulsions.

It has been found indeed highly useful in tetanic and epileptic diseases, to the former of which this complaint is contended to be nearly allied. The cold bath, and even sudden and complete immersion during the height of the epileptic paroxysm, has been used with the advantage of immediately stopping the fit;  
and

and in one case, wherein I imitated this practice in a child, I found it produce relaxation of the spasms, but it did not cure.

Dr. Currie, however, was more successful, who recommends it from the advantage which followed in epileptic complaints under his management.<sup>f</sup> We see from the above trials in Hydrophobia its failure. Howsoever apparently similar tetanus and Hydrophobia may be in the derangement suffered in the nervous system, the event of this mode of cure in the two diseases widely differs. It is therefore a corroborant of a very suspicious kind in the rabid disease, and a means hitherto found totally ineffectual.

#### WARM.

The warm bath has been frequently applied in the present disease, and for the most part at first with apparent advantage. This has encouraged a repetition; but the utility experienced has in every instance been only temporary, and has disappointed the expectations its trials had raised.

Dr.

<sup>f</sup> Vide Mem. Lond. Med. Society.

Dr. Vaughan, in compliance with the practice in use, and not without hopes from its celebrity as an antispasmodic, put it fully to the test in two of the three cases it was his lot to attend. In the third especially he carried it to a high extent. Here it was thrice put into execution. The patient bore it the first time 45 minutes; and after the first sensations were over, said he felt easier. A second time it was applied, and he continued in it for no less than two hours, feeling likewise easier. This encouraged a third trial, but he could not bear it longer now than a quarter of an hour. The bath this time was composed of milk and water. The addition of milk was meant to supply nutriment through the medium of the absorbents. All would not do; the bath debilitated and exhausted still farther.

It is true indeed, that no remedy, howsoever powerful, has been found adequate to arrest the progress of the complaint. The warm bath has failed therefore like other remedies. Its favourers will reply---true, because its application was too long deferred;---but from a careful consideration of the symptoms, we cannot entertain sanguine hopes

c

from



from an immersion in warm water at any period. In diseases proceeding from debility, it proves hurtful by inducing an additional relaxation to an habit requiring tone. Taught by so many unsuccessful attempts, it is a remedy in Hydrophobia which I would not recommend, notwithstanding the momentary relief experienced by its use. This small respite will not compensate for the increased debility which it occasions.

#### 34h. SUDORIFICS---STIMULANTS.

IT will be evident from a review of the symptoms, that little is to be expected from the first of these classes of medicines. They are, it is true, antispasmodic; but they are at the same time powerfully debilitating. In obstructed perspiration, to open the cutaneous pores experience has proved them to be highly useful; but to open them here for the expulsion of the poison would be nugatory, while all the bad effects of relaxation, a necessary attendant, would follow.

Some of the patients whose cases are related,<sup>s</sup> were thrown into copious perspiration; but the result was unfavourable, and far from giving encouragement for its repetition. If no permanent relief was experienced from the use of the bath, still less arose from sweating. On these therefore we are not to waste time, but apply means more adapted to the end, the removal

<sup>s</sup> Vide Appendix.

removal of the spasms, and support of the patient's exhausted strength.

*Alkalies as Sudorific.*

This class of medicines, which might be denominated sudorific, has been lately recommended, but not perhaps with the same view. Dr. Bardley speaks favourably of the caustic volatile alkali, and prefers it in the form of pill. In any form it will be difficult for an hydrophobic to swallow it; and unless a few drops were involved in crumbs of bread, I know of no other pilular form in which it could be administered; for I believe that it cannot be reduced to a chrystalized salt.

This medicine is indeed a powerful, penetrating, and diffusible stimulus. On the presumption of want of sensibility in the stomach, which some suppose, this is well calculated to remove torpidity, and increase action. How far these effects alone will promote a cure is somewhat problematical. This substance has been exhibited successfully, as authors relate, for the bite of the viper, and other venomous serpents; and, by analogy, the same success, they think, will be experienced

rienced from it in Hydrophobia; but the few trials made do not warrant the conclusion.<sup>h</sup>

Roux exhibited volatile alkali to Frances Ethevenoit in doses of twelve drops night and morning, without advantage.<sup>i</sup> The memoir indeed does not authorise us to call it caustic. Whether this however would create any other difference as to its anti-hydrophobic effects, than merely in point of strength, I shall not determine.

Wolf administered to two of his patients "spirit of sal ammoniac prepared with quicklime,"<sup>k</sup> in doses of from 40 to 60 drops daily, without effect: but as it was given for prevention, not for cure, it may not be considered a case in point; yet it will serve to show, that physicians had turned their attention to this remedy at least twenty years ago; it is there-

<sup>h</sup> M. de Jussieu, in the year 1747, had mentioned eau de luce for the bite of the viper. Dr. Coste, in his edition of Mead's works, mentions it also; and lately we have had recommended what is upon the same principle, viz. ammonia pura. Later still Mr. Williams has not only recommended, but related several cases of cure by it.

<sup>i</sup> Vide Mem. de la Soc. Roy. de Medicine, ann. 1783.

<sup>k</sup> Vide Encyclop. edit. Edinb. Art. Hydrophobia.

therefore scarcely intitled to the appellation of new.

Caustic volatile alkali has been found to dissolve saliva when mixed with the mucus of the mouth.<sup>1</sup> The tenacity, as well as quantity, of this secretion forms one of the greatest miseries under which the patient seems to labour. It adheres with some force to the fauces: hence the great efforts that he is constantly compelled to make in order to eject it. This is observable by the distance to which occasionally the saliva is thrown, when he is fortunate enough to accomplish his purpose. It will strike the foot of the bed, or it will dash against the distant bye-standers.

If this fluid could be changed in its quality, or prevented from thickening, some advantage at least might accrue. If the discharge proceeds principally, as I am disposed to believe, not only from the œsophagus, but even from the stomach itself, by the diseased action under which these parts labour, a change in the mode of action would consequently affect it. If the medicine under consideration should possess power to dissolve mucus, which from  
expe-

<sup>1</sup> Vide vol. I, p. 284.



experiments seems to have been proved, it will answer both for separating it from these surfaces where it adheres, and for giving a new action to the membrane morbidly secreting it.

In this light caustic volatile alkali may be admissible. Whatever the event may prove, it merits a fuller trial than has yet been attempted. Should it even be contended that the salival glands are not only greatly, but primarily affected, and the chief seat of this inordinate discharge, the same result may follow, the stoppage of a diseased, by the production of a healthier action in them; and thus in either view the medicine may apply.

The success of new remedies will always be doubtful, till time, and frequent exhibition, have confirmed their virtues. On finding no advantage from those repeatedly tried, it becomes not only lawful, but meritorious to deviate from the beaten path, and even at some risk to exhibit the *remedium anceps*.<sup>m</sup>

Fixed alkaline salts have been proposed as the readiest means of checking the vitiated discharge

<sup>m</sup> *Melius quam nullum, anceps remedium. Cels. Aphor.*

charge from the stomach. This organ, under Hydrophobia, seems to contain a morbid poison. It appears generated in the ulcers and abraded surfaces of their epidermis; and the discharge proceeding from them is renewed as fast as removed. The *volatile* alkaline salts, as has just been seen, have been suggested, but the fixed have been thought preferable, from their property of dissolving animal mucus; but no proof is afforded wherein they were successful: and the fixed alkaline salts have never been found useful in checking the progress of morbid ulcers. They are sufficiently well calculated to wash the poison from a fresh wound; but here their virtues would seem to stop. The destruction of the poison, and the process of healthy granulation and incarnation must be promoted on different grounds.

Would the exhibition of the nitric acid be effectual? This acid in the form of unguent is efficaciously applied to some species of ulcers generating a morbid poison; ulcers on the cilia of the eye-lids, and some others. I know from experience, that while it strongly stimulates, it forcibly astringes, contracting the surface of the ulcer, lessening the discharge of lymph, and producing a new action, whereby  
the

the vitiated surface sloughs off, and a speedy cicatrification is promoted. Whether it could be safely administered sufficiently concentrated to give hopes of these effects may be a doubt. This hint surely, in so desperate a disease, cannot be deemed censurable, where the most powerful remedies have been given in vain.

These two practices, I readily own, involve a difficulty; they seem even contradictory. If the caustic volatile alkali be recommended from its soluble virtues over an admixture of mucus and saliva, and if the nitric acid thickens them, both cannot be useful. The question in this case is, which of the two indications should be first pursued. By the former remedy we aim at dissolving the adhesive mucus in order to its more ready ejection; in the latter we attempt to constringe abraded surfaces and ruptured cuticular vessels, to prevent a copious discharge of lymph, and obtain cicatrification. To reconcile them I would say, that the caustic volatile alkali appears more adapted where no abrasions exist, and where a diseased action secretes too great a quantity of fluid, whether in the mucous membrane of the stomach and œsophagus, or in the glands separating saliva; while the nitric acid would  
 seem

seem equally adapted for agglutinating ruptured vessels, and for promoting the healing process.

The disease I have divided into two stages, of which the first appearance of Hydrophobia forms the middle point or boundary between. Perhaps one of these remedies might be found better adapted to the first of these stages, the other to the second stage; but in such speculations, where so little certain data are afforded, I dare not proceed. Hypothesis is a dangerous guide; the path to which it points should always be trod with caution.



6th. *VENESECTIO*N.

FROM the earliest accounts of this disease to the latest case on record in this country,<sup>o</sup> this has been a favourite remedy, and scarcely omitted in a single instance; nor were practitioners satisfied without copious and reiterated trials. If the other means were highly debilitating, this was still more; neither will it be any apology to urge its antispasmodic powers. Where active inflammation exists this argument will hold good; but in the present instance we have none, or, if any, it is of a species totally excluding the use of the lancet.

Boerhaave, with all his sagacity, fell into this mistake, denominating the disease highly inflammatory. His authority was long powerful in the medical world, and the pathologists of the present day are scarcely emancipated. It is not my intention however to reflect on, but to speak with becoming deference

<sup>o</sup> Vide Appendix. Smith's case, 1796.



rence of this great man, whose labours have conduced so much to the advantage of medical science. I would be understood merely to point out the influence of a great name.

Fothergill, and others of the present day, used it freely, and although it appeared to me formerly a very doubtful remedy, I hesitated, on first turning my attention to the disorder, to contradict a practice so universal. Strengthened however by the opinion of Rush, Mease, and a few more ingenious pathologists, I no longer maintain this doctrine.<sup>p</sup> “I should conceive V. S.” says Dr. Ferriar, “to be an ambiguous remedy in this complaint.” He does not indeed absolutely condemn it, but he adds, “with us it was prohibited by the state of the pulse, the advanced period of the disease, and the free use made of it a few days before by the patient.” He was twice bled.

It

<sup>p</sup> Dr. Mease, in his Essay on this subject, quotes a passage from my Remarks, edit. 1, 1785, wherein I stood undetermined respecting V. S. while I cast a look towards the great characters who used it, and seemed afraid to throw my feeble voice into the opposite scale. He is of opinion, and I now perfectly agree with him, that my hesitation on that subject needed not to be great; no symptom in any wise authorising the practice. Vide Mease on Bite of Mad Dog. p. 108. London.

It may be said, that an examination of the cases in this disorder will prove the presence of sometimes a hard, full, and strong pulse; but this is not sufficient authority at all times for V. S. Irritation, and it is here of the most forcible kind, will give a strong degree of temporary vibration to an artery. A change almost momentary, from soft to hard, feeble to strong, sufficiently proves the affection of the pulse by irritation. It will likewise, for a time, be affected by great and sudden pain. A cautious physician will never use the lancet from the mere circumstance alone of a pulse hard and full to the touch at his first examination, without deliberately weighing all the phenomena.

In some of the dissections slight marks of turgescence were seen on the brain; and in several, by Morgagni, the lungs were reported to be loaded with blood. These cases appeared to be of the spontaneous species. This last, in the rabid, is a doubtful occurrence.

The

<sup>†</sup> I am aware that Lieutaud has pointed out from dissections, both inflammation and suppurations of the stomach; but later dissections have detected nothing of this kind. Some doubts may remain respecting to what species

The former is so slight, that an indication for V. S. cannot be founded on it; and in the latter, supposing the lungs loaded, the general train of symptoms, evidently indicating debility, will not authorise the use of the lancet. The pulmonary turgescence appears to proceed from the debility of the heart unable to exercise its usual functions, or propel the blood with its wonted energy. A mere stagnation of this fluid is not a proof of active inflammation; and copious V. S. would be practised with as bad success as in bastard peripneumonia, where it is generally followed by dropsy and death.

Another proof that the lungs are not in a state of inflammation arises from the patient's ability to use violent exercise, such as running, and

cies these may have belonged, or whether, strictly speaking, they were at all hydrophobic. An erythematous inflammation exists, but not of the kind to produce pus.

Dr. Ferriar's patient had no marks of inflammation either on the pharynx, larynx, trachea, or pulmonary system, except a slight adhesion on the posterior part of the left lobe. In the course of the three months intervening between the bite and the disease, he suffered under an inflammatory catarrh, which yielded to the common remedies. Might not this adhesion proceed from thence, or from some previous inflammatory affection? But a turgescence merely in the pulmonary system is not a mark of inflammation, it is a mark only of retention.

and even from thence obtaining relief. On the contrary, there have been indisputable marks of debility discoverable on dissection, both by the fluidity of the blood in the heart, and the quick putrefaction of the body after death.\*

In a few hours after John Brown's decease, "a considerable degree of blackness was observed about his private parts, his throat, and shoulders, where he was bitten, which had no ulceration upon it; and likewise about the eyes, which were quite sunk in their orbits."

Sometimes a small mark of gangrene is observable on the diaphragm, not spreading over its surface, but confined to a single spot; but no inflammatory character can be established from so circumscribed an appearance. Similar spots have been discovered on the surface of the lungs, and in some other parts, from the bite of the viper. The heart has been found irregularly dilated from convulsions, and the pericardium, in some cases, closely adhered to it, without the intervention of the smallest drop of fluid; a clear evidence of the spasms with  
which

\* Vide Dissections, vol. 1.

† Vide Med. Obs. and Inq. vol. 3, p. 367.



which this organ has been affected; and affording, in my opinion, though not a proof of inflammation, a full explanation of the pain at the pit of the stomach, and sensation of suffocation, of which most patients so grievously complain.

May not the relief experienced from running be referred to the increased motion of the blood renewing the circulation, now irregular and languid?<sup>t</sup> and may not the same explanation be given for the relief experienced in the open air by an hydrophobic boy?<sup>u</sup> On the whole, in condemning Venesection I conceive myself nearer the truth than when, by the authority of great names, I was held in suspense on the subject.

<sup>t</sup> Vide anecdote in Transf. of a Society, &c.

<sup>u</sup> Dr. Vaughan's third patient.



### 7th. BLISTERS---RUBIFACIENTS---

## EMBROCATIONS.

BLISTERS are indicated, with few or no exceptions, in every spasmodic complaint. They seldom produce debility, and they often remove irregularity in the distribution of the fluids; but they act perhaps too slowly in the instance of Hydrophobia. We cannot obtain their stimulant and rubifacient effects sooner than from three to six or seven hours; nor their complete vesicatory effects sooner than from twelve to sixteen or twenty-four hours; and in this time the disease may have arrived at its utmost extremity.

Dr. Gray's patient was much relieved by a blister to the throat: he was able to swallow about *three* hours after its application.✓

Dr. Ferriar says he would apply them to the throat if he had again a case of the disease

♥ Vide Med. Comment. D. il. vol. 2, p. 308.

under his care ; nor should he in the least hesitate, he adds, in applying them between the shoulders. He advances this opinion on the grounds of a *peculiar inflammation* existing in the stomach and œsophagus, which he supposes to be present in every case produced by rabid contagion. In the dissection made by him, the water in the ventricles of the brain, compared with the healthy state, was a little augmented. While this proves an increased action of the vessels, whether sanguiferous or exhalent, it would seem to point out the utility of vesication, both with a view to lessen this, and to quicken at the same time the absorbent power of the lymphatics. This indeed is only attacking a symptom, but it is a symptom in an important organ, the morbid condition of which must hasten the fatal event. I should be inclined to apply them to the hinder part of the head, or about the top of the spine.

### *Rubifacients.*

As a sense of suffocation, with anxiety at the pit of the stomach, is a characteristic mark of the disease, stimulant embrocations, if not  
actual

actual vesication, may be used to the part. Rubifacients, composed of the warmer gums, may be better adapted to the patient's convenience than blisters, while the good effects will not be greatly diminished. The violent agitations experienced render it difficult to keep the denuded surface covered with proper dressings; and exposure to air, under this condition, is detrimental.

Whether we consider the oppression of the scrobiculus cordis as arising from the internal lesion of the stomach, or from the inordinate commotions and spasmodic contractions of the heart, a derivation of the fluids from the internal to the external surface, with the new action created by this new stimulus, may have good effects in lessening this distressing symptom. For the same reasons similar applications would seem indicated to the region of the heart itself; but as large quantities of fluid must be drawn off by so many blisters, and tend to debilitate by the depletion of vessels, it would be preferable to use plaisters of the warm gums, or embrocations of stimulating oils.

Another distressing symptom which may be denominated characteristic, having so few exceptions,

ceptions, is the *uncommonly* great sensibility to cold air. This is a strong proof of the diminished energy of the *vis vitæ*. This is a symptom indeed, but in a less degree, introductory to all febrile affections. As in our case it is peculiarly distressing, and as the spinal marrow gives origin to a great part of the nerves of the trunk of the body, it would seem to follow, that stimulating applications in the course of the spine must be attended by some beneficial consequences.

Rubifacients, or strong embrocations, may, with great propriety, be applied here. The latter have been applied and recommended by the best modern authorities. Would not plaisters of the warm gums, quickened with a small portion of cantharides, be a more suitable form? The intention being the same, the choice rests only in the form. These can be retained on the part, by their adhesive nature, at pleasure; and the accumulated discharge through the pores of the skin being prevented from dissipating, heightens the stimulus, which from a thinner embrocation suffering it to evaporate, would be lost. Besides, as embrocations are more liquid, and the application of friction for a certain time necessary, the preternatural



ternatural sensibility of touch in the patient, with his horror to any thing fluid, will render them incommodious, and lessen their good effects.

Difficult deglutition, another essential symptom in this disorder, has pointed out to practitioners the propriety of these remedies to the throat. Whatever is found to renew a fit ought studiously to be avoided. Every shock of this nature, while it adds to the debility of the habit proportionally renders nugatory all future efforts to procure relief.

Dissections do not afford sufficient information respecting either pharynx or larynx, to which difficult deglutition can be attributed. The slender marks discovered in one or two cases, between the cartilages of the latter, is inadequate to the explanation of the symptom. We must look for it then to the œsophagus and its connecting parts; but whether it arises from lesion, or distant sympathy and association,\* or from both, as would appear to be the case, is not now the question. To render it less permanent, or remove it, if possible, is to be our task: it is of the utmost importance

\* Vide Zoonomia, vol. 2, p. 158.



tance in the treatment of the patient. For this reason I condemn the reiterated attempts of busy individuals to *force down* drink. It is wanton and cruel. The patient would, were it possible, take plentifully of liquids; for his thirst for the most part is intense: but every attempt redoubles his misery, and he has become furious against officious attendants, and even the physician, when these solicitations were continued.

We find not only the sight, but the word *drink*, to excite preternatural commotions; and even the pouring of a fluid from vessel to vessel to produce the greatest horror.\* How much is our commiseration awakened on reading the practice of Celsus, Van Helmont, and others, who were led by a mistaken pathology, in half drowning their miserable patients!

Nature, in this disease, seems abhorrent to fluids, and Nature ought to be obeyed. The aversion indisputably arises from some unconquerable cause; some existing impediment, whether palsy of the muscles concerned, or diseased

\* "He cried out aloud on the person who was employed in pouring the water, calling him villain, and exclaiming against the cruelty of such treatment."

Vide Med. Transf. vol. 2, p. 58.

diseased sensibility. A frequent repetition of efforts under this condition can only gratify idle curiosity.

The deglutition of medicines may be urged with some propriety. Unless for such purposes, let him be spared the convulsive throws accompanying the exertions. In every case however deglutition is not equally impeded: even where it is most free, it is better to take advantage of it only for the application of remedies; for food seems almost inadmissible from the impaired function of digestion. In this state food is not nutriment, and may prove an aggravation of the disease.

8th. *MERCURY.*

WHEN we were considering prophylactics notice was taken of mercury. Much had been written in its favour, and with ability. All the arguments so speciously advanced, and the supposed proofs of its utility, by negative instances, when properly balanced with positive failures, fell to the ground. It will appear from a similar examination unprejudiced and open, that the same conclusion must follow from its exhibition during the continuance of the disorder. For the last fifteen or twenty years, from the respectability of the names that supported its administration, practitioners have embraced every opportunity of putting it to the test. From this body of experience we must reject it, not only as useless, but even under suspicions of its becoming injurious.

If we reason from a supposed analogy between the salivation by the remedy, and the increased flow of this discharge by the disease,  
and

and from thence draw our conclusion respecting its virtues, we cannot take advantage of it from the rapidity with which death approaches. A very few days close the scene ; but a few days of its exhibition are not sufficient to kill a poison, which, according to my idea, is universally diffused over the system.

Observe the time that is requisite for its administration, before it is capable of destroying the venereal virus. Not days, but weeks ; in many cases months, and in some a year,<sup>y</sup> and upwards, must pass before this be completed. Yet were we to reason on it we should find more probability of its success now, than if exhibited as a prophylactic. In the one there is a disease to oppose by a remedy, which we hope to find in mercury, and cannot *positively* conclude to the contrary till taught by experience : in the other it is administered as an antidote against that which has no existence.

Mercury however when it acts on the habit, produces strong irritation. The disease it has to oppose is one of high irritation, and the greatest perhaps under which the human  
body

<sup>y</sup> This is to be understood of syphilis.



body can labour. Dr. Ferriar, whose opinion with me has much weight, says, "I own I have some doubts respecting the propriety of using a remedy, which produces so great a degree of irritability in the state of high irritation attending Hydrophobia." This opinion was delivered not in a hasty manner, but after comparing the symptoms of the disease with the appearances on dissection. An erysipelatous state of the stomach, approaching to gangrene, and speedy solution of parts so essential to life as the stomach, is an unfavourable condition for the reception of a substance well known to produce and hasten such a solution.

I shall not take up the reader's time by quoting a number of examples to corroborate these conclusions. In the histories of cases annexed to this treatise several will be found; and it will there appear, that even salivation, quickly raised and kept up to the last, afforded neither respite nor protraction. This is evinced in Dr. Gray's patient, the slave boy; and by Dr. Raymond's. In the latter mercury was exhibited, and a salivation kept up from the time of the bite till the disease terminated in death, a space of somewhat more than forty days.

In



In others it will be seen, that mercurial pills were taken, and mercurial unction, with no sparing hand rubbed in on the cicatrices, on the throat, the arms, the legs, the thighs, and almost on every part of the body; yet to no better purpose, than if powdered chalk, or other insignificant substances had been used in the same manner: “but do you condemn mercury thus without a qualification.”<sup>2</sup> I answer, the result of our experience is as I have represented. But should it still be insisted on, that these experiments have not been sufficiently numerous, nor sufficiently varied, to produce its total condemnation, I shall not give my negative against their multiplication to those who may still place confidence in its virtues: but were the superintendence of a patient to fall to my lot, I should not waste the precious moments remaining for action on a remedy that has proved so fallacious in the practice of other men of acuteness and discernment.

<sup>2</sup> Dr. Haulston, Med. Comment.

*9th. Running or violent Exercise---Application  
of Cold, natural or artificial---Ligatures---  
Extirpation on the first Pain felt in the  
Cicatrix.*

AMONG the cases of this disorder, collected by the Society for the Improvement of Medical Knowledge, two instances were adduced, where considerable relief was afforded by running, by which it was alledged, from observing this temporary respite, that future experience might discover something favourable from the prosecution of this hint. A short time before death a patient ran round Smithfield, and was somewhat relieved from the suffocation which before oppressed him. This is the *fact*; and the conclusion from it would seem to be, that whatever excites the arterial system to more frequent contractions, by more equally distributing the blood, removes obstructions which were either the consequence of their weakened energy, or conduced to excite them.

Medi-

Medicines founded on this theory should consist therefore of cordials, and diffusible stimuli: for if we admit the weakened *vis vitæ* to be roused by the new force now applied in the act of running, these stimuli, though the body be at rest, must equally excite it. Long and forcible exercise however of the muscles is always followed by a proportionable debility. A stimulus of this kind is therefore unsafe. It exhausts the small portion of irritability remaining. It cannot be continued.

When persons were stung by the tarantula, experience proved, that the cure depended on violent agitation. Dancing, as the reader knows, was the practice. No sooner did the spider infuse his poison, than music was provided, and the sufferer set to dance till he often dropt down through excess of fatigue. He was then put to bed, and after sufficient rest, and copious perspiration, found himself cured. The real cause of the cure was to these people unknown: they attributed it to the music; for the musician was to display his skill in the art, and run through all the modulations his genius supplied, till some happy strain caught the patient's fancy. It is well known, that by the perspiration which this violent stimulus  
pro-

produced, the cure was performed; and it is also as well known, that the same poison, provided it be allowed to have existence, can be expelled by means much more simple and safe, consisting of cordials and diaphoretics.

Reasoning in this way, dare we apply them in the case under review? Is there a sufficiently strong analogy between the effects of the sting of the Italian spider, cured by dancing, or by diaphoretic cordials, and the agitation by running, producing, in some, temporary relief under the influence of Hydrophobia? and dare we on this ground pursue a similar mode? To this I know not what to answer. The cursory review which has been already taken of sudorifics, was not favourable to their general and unlimited exhibition. Yet from carefully watching the juvenia and lædentia something may be collected.

It is well known that exercise promotes a disposition in the body to absorb oxygene; and oxygene, it is equally well known, gives out heat, oxydating the blood, and stimulating the heart: heat is in a diminished quantity in every instance of this complaint. This process appears to me not one of  
the



the least uses of exercise.<sup>a</sup> Motion expands the chest, and giving action to every muscle, by promoting a quicker circulation, creates a larger decomposition of atmospherical air entering the pulmonary system; but to render the good effects resulting from exercise permanent, it must be gentle and long continued. Exhaustion, the consequence of violent exercise, cannot be considered as tending to the removal of a disease of debility: running, therefore, in this point of view, becomes a dubious mode of acquiring relief in Hydrophobia. A substitute capable of communicating this principle in a more gentle and natural way must be applied.

Another idea which has been suggested, is the application of cold to the cicatrices at the time shooting pains in these parts are first felt, giving intimation of the approaching disease. To benumb the part by such application, and render it incapable of continuing irritation, might afford means, it is thought, of arresting the mischief, and give at least a better opportunity of fortifying the system against its attacks. Whether the disorder was about to be propagated

<sup>a</sup> Vide Garnet's Lectures on Preservation of Health.



gated by absorption, or by irritation producing a sympathetic action over the nervous system, exclusive of the other, is no objection to this practice, as in effect the result will be the same.

A stoppage in the oscillations about to produce the malady in the one case, or the detention of the virus from mixing with the mass of fluids in the other, according to this reasoning, would equally follow; but here we have no experience to guide us; such an attempt has not yet been made; and there appear no reasonable objections against it. It is an external application from which no mischief can be apprehended, unless it be carried so far, by artificial productions of cold, as to produce mortification.

On the same principle, but with analogy in other diseases to support it, is the application of ligatures above the wounded part, between it and the heart, in the course of the lymphatics, leading to the point where the absorbent fluids mix with the blood. This has been practised in the bites of serpents, and it is affirmed with good effect. It is asked, why may not this be useful also, both at the time of receiving the bite, and at the time of the first sensation

fation of pain in the cicatrix, the first harbingers of the disease? I answer, most certainly: unless it was to interfere with other means better adapted for the purpose, let it be taken for a help, slender as it may be, to prop us for a time. Instances have occurred and may again occur, where nothing more efficacious can be attempted, as an external means from antipathies, &c. of the patient.

But where it is possible let another mode be attempted, and on the same principle likewise, a mode by far more rational, and from which more safety may be expected; this is extirpation of the cicatrix; and let it be executed now in the same manner, and with the same precautions as were directed when treating of prevention, at the time or soon after the bite.<sup>b</sup>

Reasons were advanced for the propriety of this practice, even when the disease is about to agitate the habit: for till this time I hold the disease to be local, and the chance of extirpating the cause with the cicatrised parts great.

E

After

<sup>b</sup> Vide vol. 1, p. 130, et seq.

After extirpation at this moment, to give the operation all its efficacy, and the patient the fullest chance of escape, caustic volatile alkali should be dropt on the fresh cut surface, in order, by its penetrating and speedily dissolving power, that every diseased particle may be destroyed, continuing the repetition till we be assured this has been accomplished. Whether the malady is about to be produced by nervous irritation, and consequent sympathy of the whole nervous system, as contended for by some; or by irritation on the nervous muscular parts of lymphatics, as contended for by others, and consequently absorption by exciting them to action, the effect will be the same; the good atchieved equally certain.<sup>d</sup>

The state of the cicatrices in Dr. Gray's patient will warrant the practice.<sup>e</sup> A blister was applied over one of them, where the surface

<sup>e</sup> Ammonia pura.

<sup>d</sup> Every medical man, every pathologist knows the absorbents, in common with other parts, to possess nervous energy; and that *irritation* therefore must be prior to action even in them: and the consequence of this action will be absorption of the matter, whatever it may be, in contact with their mouths, and fitted to their capacities.

<sup>e</sup> Vide vol. I, p. 77.

face was smooth, and even exhibiting nothing but the usual marks on new cuticle. The blister however in removing it, laid open to view a deep and unseemly ulcer, while it had no effect beyond common on the surrounding sounder parts. It cannot be doubted from this fact, but extirpation at the time of the first sensations of local pain, would have afforded well-grounded hopes of successful prevention. From this instance likewise, the favourers of absorption may derive another argument to support their cause.

10th. *OIL.*

THIS remedy was in use among the ancients. Celsus and others recommended it, but it has been long neglected; and we may fairly presume this to have arisen from the want of success. A few years ago however the idea was revived.<sup>f</sup> Dr. Shadwell, of Brentwood, was called to Wyburns (a lad) labouring under this disease. He ordered the patient's body several times to be anointed with oil; but fruitless attempts were made towards its internal exhibition. On the failure of this, clysters of mutton broth and oil, as a succedaneum, were injected; but the patient died without the least respite from the remedy.

At this time a man in the neighbourhood received a bite from his own dog: this, and the death of the lad from a similar accident,

ren-

<sup>f</sup> Vide Mem. Lond. Med. Soc. vol. 2, paper by Dr. Simms.



rendered him extremely unhappy. His agitation was heightened by reflecting on the delusion of a specific which he knew Wyburn to have taken, and which was considered as infallible. On the tenth day from the accident he is found labouring under symptoms of difficult deglutition, violent spasms, and a high degree of mania. The doctor was called, and he ordered oil to be plentifully administered in all the different modes mentioned, and after some days the man recovered, as if from a trance, "his mind presenting to him nothing but a blank," from the time he was taken ill. He continued the oil for a week longer, and was cured. This, as might be supposed, made a considerable noise, and a happy victory was announced over an enemy hitherto unconquerable, except in the fancies of compounders of specifics, and their followers.

A review of the symptoms in this case, and a careful comparison with those where rabid virus had produced the disease, will convince us, that the affection under which Cumbers (this was his name) laboured, had but a distant relation to rabid Hydrophobia, and can only be considered as the effects of fear. The attempt however to cure Hydrophobia by this  
new

new method was laudable, though its failure in several succeeding trials has destroyed the high expectations then raised.

One of these trials was made on a patient under the care of Dr. Maclean;<sup>h</sup> but as this man and Cumbers were differently treated, it was alledged that this could not operate against the remedy.<sup>i</sup> No great difference however in reality arose in the mode of exhibition. Cumbers was anointed from head to foot, and *some* administered internally. At Sudbury the unction was only partially used in form of friction to the neck and chest every hour, till an oil bath could be procured. In this, when ready, he remained ten minutes, when that uneasiness, that horror, which hydrophobics constantly express at the touch of every thing fluid, whether hot or cold, water or oil, irresistably caused him to spring into bed from the hogthead in which the oil was contained, with an agility astonishing to all employed about him. The oil bath is one of the means, which had been pointed out as proper, in the memoir

<sup>h</sup> Sudbury.

<sup>i</sup> Vide Mem. Lond. Med. Soc. vol. 3, p. 470.

moir from which Dr. Shadwell copied his practice.<sup>k</sup>

It was recommended likewise by Celsus and Aurelianus. The former indeed advised it differently ; for according to his plan the cold bath was immediately to precede it. If the practice proved any thing, it was the inutility of the oil bath ; for it speedily made the patient uneasy, without procuring any respite. The experiment perhaps would have been more complete had universal unction, in place of partial, been adopted ; but I am firmly of opinion not with more success ; because this was a case where rabid infection gave existence to the disorder ; the other admitted of cure, because it was excited by fear, and without rabid infection. Immersion in oil, in the Sudbury

<sup>k</sup> In a letter which I had written to Dr. Maclean, in consequence of his having informed me, that accidents had just before taken place from the ravages of a mad dog in his neighbourhood ; and Tweed having fallen a victim to the disease, in the vicinity, in whose case oil exhibited by the mouth, and applied in friction, proved unsuccessful, I had suggested, should another accident take place, the use of an oil bath in preference to friction, as appearing more consonant to the idea given in the Greek M S. published by Dr. Simms. Dr. Maclean, with a readiness, creditable to his humanity to adopt whatever, even in appearance, might afford a chance for relief, put in practice this hint.

bury case, it might be argued, was even a more efficient way of obtaining its virtues than by unction; and the difference rather in favour of the latter. On this kind of reasoning however it would be trifling to insist.

A little before this an opportunity had presented of exhibiting the same remedy at Long Melford, in that neighbourhood; and the person (Tweed) an unhappy victim of the same dog. An attempt was made, but at too advanced a period of the disease to give it pretensions to an experiment. The patient was nearly in the agonies of death; and whether it was by his struggles while they poured oil into his mouth, or by nature already exhausted, I shall not decide, but his death instantly followed.

The next trial in this country, in spring, 1796, was a fairer experiment, in as far as quantity swallowed gave a claim to this title; but it came also too late; the patient survived only a few hours. “Immediately on seeing him I gave him a large cup of olive oil.<sup>1</sup> He had much increase of convulsive action on his endeavours to swallow it; but after getting it

<sup>1</sup> Dr. Girdlestone's letter to the author.



it to his mouth, he swallowed it very hastily. The cooling and pleasant sensations which the oil at first produced, gave him great hopes, and he was able to swallow three cups with much less difficulty. In about half an hour he had drank near twelve ounces; but from that time the oil ceased to alleviate any of the painful sensations which kept increasing until six o'clock in the evening, when he died."

Dare we pronounce favourably of oil from this temporary alleviation? Dare we conclude, that had it been employed earlier in the complaint the result would have been better? Notwithstanding my doubts on this subject, it would be rash totally to condemn a plan not yet executed to the best advantage, i. e. of applying it in the incipient stage of the disorder, and continuing it till death, or the patient's recovery: but the varying nature of the complaint requires a varied dose, a varied practice, and nice discrimination.

In the instance just quoted, as in many others, we may regret the late attendance of the physician. The young man's accident was made known to Dr. Girdlestone for some time before the accession of the disease; and some conversation respecting the event had passed  
between

between him and the parties concerned ; yet he was not called (a culpable neglect) till late in the forenoon, and the patient died late in the evening. From a plan early commenced under the doctor's direction we might have gained information, even if the patient had not been relieved. He would have pursued with caution the method adopted, and no doubts would have remained respecting the effects of the medicine, or the inferences to be deduced.

With respect to the exhibition of oil, I would suggest some doubts on the propriety of copious and reiterated draughts.<sup>m</sup> It is not always the quantity of our medicine from which good effects arise ; it is the nicety in balancing it to the strength of the malady. The repetition of the dose, when its quantity is discovered, is in a ratio to the diminution of the new action produced, the new sensations created. If the stomach, as some have alleged, be in a state of morbid sensibility, the quantity of the dose should be in proportion ; if the contrary, the reverse. Copious doses of  
oil

<sup>m</sup> In a prefatory paper to the memoir already quoted, oil is directed to be given *copiously*.

oil early in the disease, while the irritability of the stomach remains, may produce vomiting; or should this not take place, on its entering the intestines a supercatharsis may be induced.

Let the reader review the annexed cases, where early purgatives were exhibited, and he will find the stomach and bowels to require no larger purgatives than would move them in other diseases, or even in health: let him again estimate the nature of these evacuations, and the debility which they occasion. Whatever the ancients may have written on the copious deglutition of oil, prudence, and a better knowledge of the animal œconomy should forbid our strict imitation.

On the oil first touching the stomach,<sup>n</sup> “the cooling and pleasant sensations it produced gave great hopes.” It was this that led to its repetition; but the repetition, though several times made, could not prolong this fleeting advantage. The medicine seems to have done no more than would have followed from other fluids of a cooling kind, the absorption perhaps of a small portion of heat from a diseased surface, where, from the sensation of a “boiling

<sup>n</sup> Dr. Girdlestone's case.

ing heat," very often complained of in this region, it would seem preternaturally accumulated.

Thirst is also intense, and deglutition so impeded as to prevent the free admission of cooling fluids; so that when admitted, of whatever quality, they would blunt for a moment this painful irritation. Whether from such reflections and observations I know not, but we find much, I think, about the same time that oil was introduced, vinegar strongly recommended, and likewise on the basis of experience, as a cure for this disease; and from some trials it appears, that a similar temporary ease succeeded the exhibition.



11th. *VINEGAR.*

THIS had excited the attention of English physicians much about the time the use of oil was introduced; and an opportunity in this part of the country, in Nov. 1791, presented for its administration. Tweed was at this time bitten at Long Melford, in this county.<sup>o</sup> Mr. Edwards,<sup>p</sup> used such means as were admissible at the time of the accident. The wounds were in dangerous places, the cheek, chin, and throat; and from the largeness of the animal, the suddenness of attack, and the parts laid hold of, it was a matter of surprise how the man escaped from him with life.

On the first notice of the approaching disease Mr. Edwards came to his assistance. Dr. Maclean was likewise called. They agreed to try vinegar. The patient had felt some slight indisposition the day before; had passed a restless

<sup>o</sup> Suffolk.<sup>p</sup> Surgeon in that town.

less night, but went to his usual work this morning, continuing it till about ten in the forenoon, when his increasing illness compelled him to desist, and return home.

The interval between his leaving work and the commencement of impeded deglutition was very short; for Mr. Edwards, who came immediately after the man had left work, found him labouring under it. "Vinegar to the quantity of half a pint was got down about noon, and very soon repeated a second and third time." Here is another proof of the sensibility of the stomach, and the increased peristaltic motion of the intestines; for "it produced a plentiful evacuation from the bowels, and considerable perspiration."<sup>q</sup> They continued the vinegar throughout the day and succeeding night.

"Unremitting vigilance and attention was given to the vinegar plan, so that in the whole we got down four or five pints." Along with this was administered at different times T. Opii to the amount of 200 drops<sup>r</sup>----"with some little abatement of the spasmodic agitations."

Here

<sup>q</sup> Vide case Appendix.

<sup>r</sup> A pill of Op. and Merc. Flav. was administered every four hours, *ibid*.

Here is a temporary respite ; but whether we are to attribute it to the vinegar, to the opiate, or to their conjoined powers is difficult to determine.

On Saturday, the day on which he died, not finding him in a better situation from the medicines given, and willing to adopt any means that promised relief, they desisted from the farther use of vinegar, and in its stead had recourse to oil ; but the poor man expired immediately after the first draught. We find little encouragement, as far as we can rest on this experiment, to pursue the use of vinegar in Hydrophobia. Dr. Maclean however merits our thanks for the experiment.

The remedy was likewise exhibited in France several years prior to this ; for we find the *Sieur Gravan*, while under this complaint, by the direction of his physician, using vinegar, but without any influence in the malady.

In the case of *Johnston*, Dr. Ferriar prescribed a mixture, and I apprehend with the same view, a considerable part of which was vinegar. To a decoction of twelve ounces of bark he added eight ounces of distilled vinegar,

\* Vide Mem. de la Soc. Roy. de Medicine, ann. 1783.

gar, directing that from an ounce and a half to two ounces should be administered as often as possible. This was in the afternoon, and at nine the same evening he found deglutition not to be so much impeded as to prevent its exhibition. The patient however was rather worse than on the last visit; but the distance of four hours was too short to expect much alteration from the plan. It was continued therefore through the night; and by the succeeding visit, at nine next morning, above a pint of the mixture had been taken, and deglutition still less impeded than before; for besides some food given during the night, with little difficulty, he swallowed, in the doctor's presence, "several draughts of the mixture, without any striking appearance of disgust."

Although the patient was progressive towards his end, as appeared from the increase of symptoms, especially from the delirium, he ordered the mixture to be continued; but it was without success.

Small doses, without any admixture, and repeated at short intervals, would perhaps be a fair way of ultimately instructing us of its real powers in this disease. It produced purging in Tweed's case, with copious perspiration,  
 evacu-



evacuations which, in this debilitating disorder, cannot be safely permitted to any extent. If opium is to be conjoined, it should be with a design merely to restrain the former. If experiment be the end in view, practitioners should exhibit this remedy in as simple and uncompounded a manner as circumstances may permit; and continue it, unless they find it evidently hurtful.

As the principle of acidity forms a large part of this compound, other virtues may be inherent beyond those of a simple stimulus. How does vinegar operate in simple burns, in injuries from scaldings, &c. where it is said to have been useful?<sup>t</sup> Do these arise from the oxygene it contains? Applying it in Hydrophobia to a diseased stomach, a supposition here

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still

<sup>t</sup> Mr. Kentish treats the subject of burns in a different manner from what has been done by some preceding authors, or from what may be granted by some modern pathologists. He endeavours to establish certain laws, of which the following is one, viz. "That whenever the action of a part has been considerably diminished by withholding an accustomed stimulus, the re-application of the stimulus so withheld (or any other with a view to make up for the deficiency) must be very cautiously administered, until the part is gradually restored to its former healthy action." Vide Essay on Burns, p. 110. The reader may consult the passage at large,

still to be maintained, will analogy support our expectations of a similar mode of action? These are questions I must leave to the consideration of my intelligent reader.

Should the principle of acidity be considered as the useful part, and alone containing the virtues of the medicine, the cohesion of combination between it and the substance in union with it is to be taken into consideration. The more loose the combination, the more easy will the separation become, to afford it an opportunity of a new combination with the diseased surface.

Important investigations might be instituted here also, respecting what share light possesses in the composition of animal bodies. Light is always found to accompany heat, and oxygen again is in strict union with this. In a quiescent and useless combination we cannot suppose it. If it be allowed a place in the animal fibre, its redundancy or defect will create a change in the part. We cannot perhaps make the addition, presuming its deficiency, more effectually than through the medium of the oxygenous principle. This is a crude conjecture; I dare not pursue it. Yet still I maintain light not to be useless as a component part

part of bodies in either, or in all of the three kingdoms wherein it may be found to reside.

The radicals of vinegar are, according to the best analysis yet afforded, carbon, hydrogen, and azote.<sup>u</sup> The last is in much smaller proportion than the two former; but they are all oxydifiable, and retain the principle of acidity with some degree of force. I am led to infer, that as carbon and hydrogen form the greatest bulk of these radicals, the cohesion of the oxygene with them is greater, and at the same time the quantity necessary for their saturation less, than if azote had abounded in the composition. I conclude so from the great rapidity with which azote is known to attract oxygene in the formation of the nitric acid.

If an acid composition be thought useful, I should be inclined to prefer the oxalic<sup>v</sup> to the acetous. Sugar is composed of carbon and hydrogen, in conjunction with a small portion of oxygene; but to these radicals we can unite a larger portion of oxygene in the separation of its acid. By the addition of nitrous acid to sugar we can separate its acid in form of

<sup>u</sup> Vide Garnet's Outlines of Chemistry.

<sup>v</sup> Acid of sugar.

of pure crystals: we are enabled by this process to oxydate and super-saturate it, and in this way obtain a larger quantity in a given bulk, and in a looser combination; a consideration of consequence in respect to deglutition in Hydrophobia.

The farinaceous vegetables, as containing nearly the same principles, might be treated in the same way with a similar result; but I have pointed at sugar both as being speedily procurable, and easily manageable in the process of obtaining the oxalic acid.

This is a speculation however which the reader may treat as he thinks it to deserve. On the whole, if the *oxalic* acid be not thought useful, I am little inclined to place confidence in the removal of Hydrophobia in the *acetous*, or in other words in vinegar.

12th. *ANTISPASMODICS.*

FROM observing the convulsions with which the patient is agitated in this complaint, the practitioner would be naturally led to the application of antispasmodics. The articles in this class of medicines are numerous, and afford him an extensive choice. They have been exhibited in many different methods, by themselves simply, or forming parts of other compounds; but with what result is too well known. The famed musk composition has been long in use, and at this day the generality of practitioners prescribe it, notwithstanding their constant disappointment.

Camphor, as another of these, united with merc. emet. flav. and administered with a view not only to promote an evacuation from the stomach, but a copious diaphoresis, by laying the patient between blankets, has been some time since used, and a case of its supposed success promulgated. That the patient recovered



vered I do not doubt---that the case was rabid Hydrophobia I greatly doubt. Dr. James would have advanced this as a certain proof of the efficacy of his mercurial preparation; and the favourer of the camphor plan would as strenuously assert the efficacy of this substance. Afæœtida has had similar trials, with the same unfavourable event; and the same may be said of most others of this class.

Opium, the most powerful of all the antispasmodic tribe, in every different preparation yet invented has failed; and even doubts may be entertained, whether in some instances it has not been hurtful. It has been recommended and exhibited in moderate, and also in large and powerful doses; but the abatement, when any followed, was not only temporary and fleeting, but with suspicions of the share it contributed even to this respite. It has failed in very large doses. Vaughan gave to one of his patients no less than 57 grs. in fourteen hours. Mr. J. Hunter exhibited it in the French woman's case with a tolerable free hand; but Dr. Mease carries it still farther advising it from five to fifteen grs. meaning it, doubtless, to be occasionally repeated. Opium  
was

was found successful in tetanus; and arguing from the analogy subsisting between the two diseases, he concludes for its utility in this, as well as in the other disorder.

Opium has different effects, as is known to every practitioner, on different constitutions. The same quantity exhibited to one person will lull him to repose, while it will excite in another delirium, and render him frantic. Reflecting on this, it is an additional reason with me for dissuading the practitioner from trusting to it in any other manner than as an auxiliary.

I am fully persuaded of its becoming poisonous to many, before it would allay their agitations, or produce rest. This substance is now known most powerfully and speedily to exhaust the system, causing a quick expenditure of the vital energy. The repose which follows it can only be the repose of debility; a slender solace in a disease where debility forms a prominent feature.

Finding no benefit to be received under any management of this drug hitherto attempted, it is, I think, to be abandoned, in order to make room for other means which

ana-

analogy may point out as more likely to be effectual.\*

To pneumatic medicine then let us turn our attention. Our experience indeed is but limited in this walk, yet from some trials of ærial fluids in diseases of great nervous irritation, and the beneficial consequences resulting from thence, hopes may be entertained that our labour here may not be lost. Among the different species of these fluids the hydro-carbonate is first to be considered, provided we place confidence in some late trials with this gas in the removal of spasms.

Mr. Barr, as he informs Dr. Beddoes, has found it a powerful antispasmodic ; and in his opinion holds a pre-eminence far above opium. His experience enables him to speak in the following terms : “ It might be easy to produce facts to show that hydro-carbonate air is the most direct, powerful, and easily managed antispasmodic yet discovered ; that it produces

no

\* Extract of hyosciamus has been preferred to opium of late, for inducing sleep, and possessing other antispasmodic virtues. It is said to possess a laxative quality, rendering it superior to opium, which is always followed by costiveness. Whether this medicine would succeed better in this disease wants experience to determine.

no costiveness like opium, nor any effects whatever, but that for which it is exhibited; and that it will be found capable of relieving some of the most distressing calamities that are incident to humanity, such as convulsions, locked jaw, and *Hydrophobia*."

If Hydrophobia from rabid virus be meant here, as is probable, and not difficult deglutition and aversion to fluids, arising from several other spasmodic affections, it will be one of the most fortunate discoveries of the present age. We have not indeed experience of its trial in any case of rabid Hydrophobia to rest on; but were we to argue on the above authority, from the analogy of its utility in various complaints of the spasmodic class, wherein it has been beneficially applied, we should find it our duty, when occasion presents, to give it a fair and unequivocal trial.<sup>y</sup>

That

<sup>y</sup> It is now well known to the public that this gas has been called in by the ingenious Dr. Beddoes, for the relief of another complaint hitherto as hopeless as Hydrophobia; I mean consumption, and even hæmorrhagy from the lungs, under the idea of the habit being in too great a state of irritation occasioned by a disposition towards the absorption of a superabundant quantity of oxygen; and cases have been adduced of its happy effects in support of this theory.

During



That this gas is powerful in its effects we have other practitioners to testify. Dr. Withering found it to weaken the stroke of the pulse, and to produce vertigo, with occasional nausea, though diluted with eighteen or twenty times its bulk of atmospheric air. He affirms it also to have the power of inducing sleep; and in some instances, particularly in asthma, to ease difficult respiration and cough; but for restrain-

During the prosecution of this subject, its powers over several convulsive and spasmodic diseases were rendered manifest. It is obvious, that where formidable convulsions, as Dr. B. says, are already present, "no cause should be applied which renders the muscles more ready to be thrown into morbid action." A deterioration of atmospheric air, by a mixture of hydro-carbonate, has been found advantageous in epilepsy, and other convulsive diseases in young and plethoric habits, especially where the fits recurred in sleep. By moderating this irritation the fits ceased: the pulse was reduced in frequency, and natural repose took place.

Where sleep has been broken, and a habit of nocturnal watchfulness induced, it has been proposed, as a counteracting remedy, and under the sanction of experience. A reduced atmosphere, by a number of candles burning in a bed-chamber on the rejoicing night for Lord Howe's victory, procured a clergyman in this situation a night of repose unexampled for several years; and to his servant, in the same chamber, profound sleep. Other cases corroborated its hypnotic virtues, and might give birth to the proposal of administering it in Hydrophobia, where high irritation and consequent watchfulness harrafs the patient.

restraining active hæmoptoe he bestows on it the highest praises.<sup>2</sup>

Should it be productive of no other advantage to the hydrophobic patient than some sound sleep, and this without danger, it would be a medicine deserving attention, where we find opium has constantly failed, or when it succeeded, has generally left the system, as abovementioned, more exhausted, and the calamity still farther increased. Taking therefore a view of the whole of our experience in regard to hydro-carbonate gas, I would be almost tempted to look forward to it with the most pleasing hopes, as a strong shield of protection against the ravages of this dreadful foe, were I not apprehensive that it can add nothing to the real *energy* of the habit, but must rather subtract, or by its nature dissipate a part of what yet remains; and which, I am led to think, exists already in too small a proportion.

Dr. Thornton would seem to hint at the probability of the corroborating effects of this gas.<sup>3</sup> Reflecting on it as medicinal in phthisis, and calling to mind some dissections he had made,

where

<sup>2</sup> Vide Annals of Medicine, vol. 1. p. 392.

<sup>3</sup> Vide Beddoes's Considerations.

where he had discovered marks of increased secretion in the lungs, without ulceration, asks this question: "Are not tonics indicated in diseased secretions; and may not the hydrocarbonate give tone to the absorbents?" Could its tonic power indeed be proved, we ought not to refuse it a place in Hydrophobia, where so great a degree of morbid secretion exists in the œsophagus and stomach;<sup>a</sup> but this still remains problematical. It leads me however to consider how far tonics may be appropriated to the removal of this malady.

<sup>a</sup> Vide Dissections, vol. 1.

## 13th. TONICS.

WE shall leave it to the reader to determine respecting the hydro-carbonate, and proceed to another class of remedies, at present as highly extolled as any yet reviewed, viz. tonics. Many of the most powerful however have been exhibited without the smallest advantage.

In Dr. Vaughan's third case, viz. that of a child, cuprum ammoniac was largely administered. The dose was no less than two grains united to an equal quantity of extract opii, ten grs. asafœtida, and three of flowers of zinc, which, formed into pills, were given every four hours. This medicine "afforded not the smallest relief; nor did they show the least action upon the frame;"<sup>b</sup> but this want of action may be attributed to the opium with which it is united. It has been seen, by examples already related, that the stomach is far from insensible

<sup>b</sup> Vide Dr. Vaughan.



sensible even in the last stage ; but it must be at the same time acknowledged, though it cannot be received as a general law, that many cases run through their stages, and retain larger quantities of substances, both mild and acrid, lenient and stimulant, without the least apparent irritation from their action.

The indication however of cure which has been drawn from the high degree of irritability present in the frame is just, viz. that a still more powerful impression must be created to counteract that of the virus ; but in producing this new impression lies much of the difficulty ; for if it is attempted by stimuli which still farther exhaust the system, without a new supply of vital energy, death must ensue, even by the very means we are pursuing to obviate it.

In most of the dissections a thick mucus is observed to line the stomach and œsophagus. This is abundant proof an increased secretion. Tonics are found to promote absorption, and restrain many of the diseased secretions. This may be one reason for their adoption in the present instance, and on this ground they are admissible. Bark, and the different preparations of iron being more sanctioned from experience, are mentioned by authors as probable helps.

helps. Dr. Ferriar looks forward to bark, and the cold bath, the latter of which has already been under consideration.<sup>c</sup>

It does not appear that much advantage can be derived from medicines immediately applied to the stomach itself, from the perverted condition of the gastric liquor, which will oppose their solution and their entrance into the habit. But if it be argued, that the impression is to be made on the nerves in the coats of the stomach, and by this means change that secretion, independent of its mixture with the fluids, my objection is removed, and the local application of medicines admitted.

Substances hitherto taken by the mouth having all failed, create in me suspicions of surmountable obstacles opposing this mode of relief. But the most powerful may not yet have been exhibited, or at least the best mode of dosing them not discovered. Among the class of tonics one of the most powerful has been lately proposed from the mineral kingdom, and it is added experience has already sanctioned its use; I mean, arsenic.

Dr.

<sup>c</sup> Vide p. 14, on Cold Bathing as a Cure.

Dr. Russel, in his account of serpents, confirms the efficacy attributed by the natives in the East Indies to a composition now known by the name of *tonic* pills; the chief ingredient of which consists of this metallic substance. He assures us that it never failed in the cure of the bites of venemous serpents;<sup>d</sup> and, led by some kind of affinity, the natives use it also, with equal success, in Hydrophobia, not only in dogs, but in man.

These tonic, or Tanjore pills consist of six ingredients; three of them we shall call *known*, and three *unknown*. The former are white arsenic, pepper, and quicksilver; the latter vegetable substances, called by the natives velli-navi, neri-visham, and nervalam. The two first of these *last* three would seem to be of the cauli-form, or herbaceous kind, as the powdered roots are directed for use: the other would appear to be of the shrub, or nut-tree kind, as the kernel in powder is the part recommended. Equal parts of these six articles (the arsenic first being levigated) are beat into a mass, with the juice of wild cotton, and formed into pills, ten or eleven of which, when weighed, were found to be a dram, which brings them somewhat under  
five

<sup>d</sup> Vide Russel's Description of Serpents.

five grains each. The quicksilver is also to be rubbed with the juice of wild cotton till the globules disappear.

Swartz, a Moravian priest, instigated by the celebrity these had obtained for the bite of the *cobre de capello*, and other Indian serpents, through the noblest motives of philanthropy, purchased the secret from the Brachmins, and communicated it to the Company's surgeons. One of these communicated it again to Dr. Ruffel, with several experiments, proving their success. The surgeon, having made farther trials separately on the three unknown ingredients, found, that almost without exception, chickens were killed by five grains of the velli-navi root, in the space of from an hour to an hour and twenty minutes.

The progress of the symptoms were, gentle purging, convulsions of the neck, throat, and breast; the former being forcibly drawn down to the latter; universal tremors over the body, paralysis and loss of motion of the legs, and death.

In the dose of half a dram to a dog, it vomited violently, but in about six hours he recovered. The other two ingredients had less activity; they proved gently cathartic. The



surgeon used in his experiments pills made in the same proportion with the Brachmins, and they answered in every respect equally with theirs. As in general the number of pills which completed a cure did not exceed six, and sometimes fewer, the quantity of mild quicksilver is too trifling to have any share in it. The same may be said of three others; arsenic, therefore, and the velli-navi only form the powerful parts of the prescription.

We are farther assured, that the surgeon to whom we are indebted for the communication of these pills, had put them to the test in Hydrophobia. He exhibited them to no fewer than fourteen different persons bitten by mad dogs, without any other symptom than purging in most, and a slight vomiting in a few of them. This proves at least the safety of these pills, though it cannot be positively asserted that they cured the disease, unless the complaint was evident when they were exhibited. If they be meant however as preventive, they deserve no credit; there was no proof of disease.

Dr. Girdlestone, from the character arsenic had received, advised a solution of it to be administered in the case to which he was called in

in spring, 1796; but the patient was too far exhausted before the doctor saw him, and too little of the medicine taken in the short time that preceded the lad's death, to afford any idea of its virtues.

The velli-navi has considerable resemblance to white hellebore in powder. It is used in India in a cutaneous disease resembling the itch, and denominated there the Malabar itch. In exhibiting this medicine to dogs under Hydrophobia, a quarter of a grain at least of the arsenic may be given at a dose; and should this be retained it might possibly be augmented to half a grain at the interval of six or eight hours. Opportunities, we have reason to fear, will be but too frequent for putting it to the test. A dog, when tied up, can be as easily managed under this disease, nay more so in as far as respects the exhibition of medicines, as the human subject; for he seldom refuses what is set before him under the inviting form of food or drink, in which medicines may be conveniently involved, till the last day or two of his life, when the force of the disease has rendered him frantic, and deprived him of all power of recollection.

From

From some experiments on arsenic, in which we are informed Girtanner has been successfully employed, this substance, hitherto considered as a simple body, has been discovered to consist of three principles, carbon, azote, and hydrogen<sup>e</sup>; and whether any combination of these principles in the form of elastic fluids, can be adopted with success, future experiments only can show. Were we absolutely certain of the virtues of arsenic in this disease, applied to the stomach in the common way, analogy might lead us to suppose, that some such combination in the elastic form applied to the lungs, by more immediately reaching the blood, and affecting the system, would be a speedier mode of relief.

In a disease so short in its fatal termination, this would be of much moment. We have seen that the stomach and the heart, with perhaps the diaphragm, as connected with the pericardium, are the chief parts of the habit under the severest action; for the brain, though some turgescence of vessels and slight extravasation,

<sup>e</sup> Vide Annals of Medicine, vol. I, p. 411, where we are told, that the proofs from whence this conclusion is drawn will soon appear in Gren's Journal of Natural Philosophy.

sation point out also an increased action, can be considered only in a secondary view. If these gases can reach the blood, and alter, we may suppose, its composition by adding to its lost vitality, or if the phrase can be admitted, neutralising as it were the irritating particles, and by this abstraction mitigating the spasms of the heart and its appendages, a victory will be gained.

When considering hydro-carbonate gas, and building our conjectures on the reports of cases highly spasmodic, which it removed, it was under the idea, that little difficulty or danger would occur in the application. Later experience has not however confirmed the supposition. It has been since shown, both by Mr. Watt and Dr. Beddoes,<sup>f</sup> that its effects on the human body are far from free of suspicion; nay are highly deleterious. In somewhat more than one-third atmospheric, and somewhat less than two-thirds hybro-carbonate air, animal life (a pigeon) was speedily destroyed. It had a particular action on the blood; for it rendered it ruddy, and kept it fluid, as it was some time before coagulation took place.

In

<sup>f</sup> Vide Beddoes's *Considerations*, vol. 1, ed. 3, p. 38.



In examining the dead subjects the blood was observed, in several instances, to be not only black and grumous, but even fluid. Can we infer from thence the existence of a super-abundant quantity of carbon? If this be admitted, the hydro-carbonate, a substance replete with carbon, cannot be a suitable remedy. Means should rather be sought for to render the carbon volatile; to separate it from the blood, and to throw it out of the habit. Vital air seems to be the only principle for this end. With it carbonic acid gas will be composed, and emitted, and an union of it also with the super-abundant hydrogene will form water to be deposited in the natural receptacles, and carried out of the body, leaving the blood of a more healthy composition, and of a firmer cohesion of parts. A firmness of crassamentum is an indication of strength, and the red particles, in these instances, abound in quantity, and their oxydation is more complete.

The hydro-carbonate gas has a farther peculiarity, it renders the muscles, marrow, and spongy part of the bones, and indeed the whole  
through-

throughout red, even "as red as a salmon in season." It was thought that this gas rendered flesh softer on being boiled. This was the conclusion drawn by persons who ate of a boiled fowl, which had been immersed before death in this air. According to them it approached to the consistence of *boiled liver*. The quality it possesses of giving change of colour was an unexpected discovery; but after repeated experiments the fact was established. An experiment made on human blood with carbonate acid gas, and a similar one with hydro-carbonate, clearly proved that the former *did not* brighten the coagulum, while the latter rendered it so nearly equal in *redness* to blood *reddened* by oxygene, that a nice eye only could distinguish the difference of shade.

When a trial was made with hydrogen gas, it was found neither to brighten the coagulum, nor yet venous blood, to which it was applied. A remarkable phenomenon however presented; an unusual flaccidity of the heart. This formed an evident contrast to experiments with pigeons, one of which was super-oxygenated, and the other hydro-carbonated by being made to inhale these species of gases.

In

In these the heart was found *hard* and irritable.

With respect to the hydro-carbonate, its red-dening power was confined to fluid blood; whereas both atmospheric and oxygene airs brightened the superficies when applied to the coagulum. Experiments were made on venous blood at different distances from its being drawn. With hydro-carbonate in no instance did it brighten the coagulum. The conclusion drawn from these experiments is, to use Dr. Beddoes's words, "that hydro-carbonate air has little power to render blood florid, except it be fluid; but this I think," adds he, "depends on the cohesion it acquires, and not on the life it loses." Another observation has been made on the hydro-carbonate gas, which is, that if blood be immersed in it, there follows a separation of a greater quantity of serum, than when either atmospheric, oxygene, hydrogen, or carbonic acid airs are used.<sup>b</sup>

But to return; whether the principles of arsenic, as consisting of the addition of azote to the hydro-carbonate, would cause any change, remains to be tried. It is certain  
that

<sup>b</sup> Mr. C. Gimbernat.

that an animal is much sooner destroyed in carbonic gas than in either hydrogen or azote; and it is plain from this to which of the three the danger is principally to be attributed.

With respect to the hydro-carbonate, or heavy inflammable gas, it was found in the proportion of 100 cubic inches to 600 cubic inches of atmospheric air, and only two-thirds of this consumed, to produce vertigo soon after, and a state approaching to insensibility, the pulse being at one time nearly imperceptible. A relaxation of the sphincter of the bladder followed, with a sense of extreme coldness. "After the patient had got into his carriage he fainted; and his pulse, for several hours continued quicker and weaker than before."<sup>i</sup>

From the result of these trials, the former opinion entertained of it in Hydrophobia will lose of its force, and the increased degree of cold, a sensation of which the hydrophobic patient generally complains, together with a quicker and weaker state of the pulse, which continues for several hours after the air has been

<sup>i</sup> This species of air is best when new. If kept some time after being prepared, a deposition takes place.

Vide Beddoes's Considerations, vol. 1, ed. 3.



been used, will strengthen the objection. It is difficult indeed to speak with any degree of confidence on this subject, at present, from the confined number of trials before us. By a farther dilution of hydro-carbonate with atmospheric air, happier effects may arise. Mr. Watt is decisive on this head. If it be taken only a little diluted, he finds "the greatest part to be expired without having had any action; but by dilution time is given; and there is a continued action upon the blood, which though less violent in its immediate effects, lasts longer, and seems more friendly." Yet on the whole, in the disease we are investigating, I fear it is inadmissible; and if elastic fluids be the object, we must look to a different gas for relief.

It would be a desirable circumstance to ascertain the state of the body under Hydrophobia with respect to oxygenation. If a larger portion of this principle should enter the habit, hilarity follows, and a cheerfulness of temper: if a still larger, a state bordering on disease; and if a higher gradation be continued, symptoms of inflammation, greater or less, according to this proportion, will be the consequence. These facts Dr. Beddoes's experiments



ments have put beyond doubt.<sup>k</sup> In Hydrophobia blood drawn from a vein is always said to have a healthy appearance; but a single experiment to determine this more accurately, beyond a superficial view of its external surface, I believe, is not recorded.

It appears indeed, that the buffy coat, as it is generally denominated, or a separation of the fibrous part or coagulable lymph is never present; and that the surface of the blood is always florid: but contact with the atmosphere will impart this colour to the superficies, be the texture beneath what it may.

The serum of the blood contains azote.<sup>l</sup> "The serum appears to be a mucilage, consisting of water, acidifiable oily bases, muriate and carbonate of soda, with calcareous phosphate." The red part is possessed of the same characteristics as the serum, with the difference only of iron in a greater proportion.<sup>m</sup> The coagulable lymph, or fibrous part, when well washed, remains

<sup>k</sup> Vide Considerations.

<sup>l</sup> Vide Cavallo on Factitious Airs, p. 233.

<sup>m</sup> A complete analysis of the blood is not intended here: the reader is referred to Fourcroy, Cavallo, and others, who have more particularly made the investigation their subject.

remains white. Even the gentlest heat hardens it in a singular manner. It is however very liable to putrefaction. Treated with the nitric acid, a considerable quantity of azote is discovered; likewise a quantity of prussic acid. Treating it with proper tests the oxalic acid is at the same time discovered in it. This may tend to strengthen a crude idea already entertained,<sup>n</sup> that oxalic acid may be deficient, as well as other parts of this variously compounded fluid.<sup>o</sup>

The carbone, hydrogen, and azote, constituting the substance of the fibrous part are separated in different proportions (on analysing it) to combine with oxygene in the nitric acid, for the formation of the prussic and carbonic acids in the form of gas, and by crystallisation for forming the oxalic.

The fibrous matter is likewise soluble in the muriatic acid, and a green jelly is formed. By the help of heat it is dissolved in the acid of vinegar.

These

<sup>n</sup> Vide page 66.

<sup>o</sup> It may be objected, that the oxalic acid here is the product of these trials, and not previously existing in the blood.

These are some of the results discoverable by chemical tests applied to healthy blood out of the body. They serve to inform us of its principles; nor can it be doubted respecting the changes which this fluid undergoes while circulating in its proper vessels, in a state of the body under disease; but the precise condition not only of hydrophobic blood, but blood in other states of bodily derangement, may not be easily discoverable, because a standard by which it may be measured cannot be easily fixed.

In a dissection mentioned by Morgagni, the great putrefaction of the body is advanced as a reason for the slight examination made. Yet the weather for the season was cold, and the distance from death only sixteen hours.

Brechtfeld's examination likewise tends to the same point.<sup>p</sup> He found the right ventricle full of grumous blood, and the left with blood altogether fluid. In a third instance by Morgagni, the heart had a small quantity of blood in it, like black pitch half dissolved; and in the same patient the blood in the head is described as of a black colour. Allusion is  
made

<sup>p</sup> Vide Morgagni.

made to three other cases, where a lividness after death appeared on different parts of the body externally, the fingers, neck, back, and shoulders; while in another case, the blood on opening the body was fluid, and did not, when cold, congeal in the open air.

Blood, when combined with alkalies, without being previously decomposed, becomes more fluid by standing.<sup>q</sup> Dare we assert the super-saturation of the blood with alkali in these instances? Can the fluidity discovered on opening these cadavera be ascribed to this cause? Soda and ammonia are both detected in blood; the former, it has been affirmed, exists in an uncombined state. A green tinge is communicated to syrup of violets by the serum of the blood, or, as it has lately been called, the albuminous fluid, a proof of its alkalescence.

If the serum be exposed in an open vessel to a hot temperature, a decomposition takes place; it putrifies rapidly, and ammonia is separated in form of ammoniacal carbonate, with an oil insufferably nauseous in smell.<sup>r</sup> Ammonia

<sup>q</sup> Vide Cavallo on Factitious airs, p. 229.

<sup>r</sup> Serum also contains soda in a naked state, and in possession of all its properties.



nia is the true solvent of the albuminous part of the blood; and if fluidity be produced by alkalies, it is to ammonia I would place it.

With respect to speedy putrefaction after death, more instances, besides the few lately given, are related by the industrious Morgagni; among which is the body of a hydrophobic woman after the short period of fifteen hours, even in the middle of winter. The conclusion from the whole is, that hydrophobic bodies tend to a rapid putrefaction. This granted, does not the speedy dissolution seem to argue a defect of vital air in the habit as the effects of the disease?

Let us now examine whether in the living hydrophobic we can discover signs of this deficiency. In the history of Wyburn's case Dr. Shadwell notes, after mentioning the lowness of the pulse, "the nails of the toes and fingers were perfectly bleached, and the skin cold to the touch." I apprehend this will appear to proceed from infra-oxygenation. The following fact goes far, I think, to place it beyond doubt. On inspecting the tongue, "a lead-coloured stripe appeared running along the middle of it." Should this be the fact it must totally exclude the exhibition of hydro-carbonate,

nate, and will call for a supply to counteract deficient oxygenation. We shall prove this principle, in a certain degree, to be powerful in removing irritability, and favourable to sleep.<sup>s</sup> Whatever restores equilibrium to the fluids, and promotes their due distribution, the just proportion likewise of the different component parts being preserved, we know, invigorates the habit, and establishes health; and health establishes sound and refreshing repose.

A slight consideration of the circulating mass will sufficiently convince us of the disproportion that must occasionally take place between the quantities, as well as qualities of the particles.

View the blood of a person of a vigorous habit in the plenitude of health; let him be reduced by deficiency of food, by alvine and cuticular evacuations, by repeated V. S. or by all these together. The composition of the blood will now be found materially changed.<sup>t</sup>  
are

<sup>s</sup> Vide Mr. Atwood's case, and others, described in Beddoes's Considerations.

<sup>t</sup> Amongst other changes, the red particles in particular will be deficient. A person weakened by evacuations,  
or

If each series of vessels, each order of glands meet with this fluid depauperated of some of its usual particles, the new fluid, which these are destined to select and form, must be deficient in some of its proportions. Thus neither the usual strength and energy will now be communicated to the muscle, to the membrane, the cartilage, the bone, the marrow, nor to the nerves. All will be robbed, in some degree, of their accustomed share of certain materials necessary for their proper functions. Whatever the principle withheld from the blood may be, all its dependencies, every part of the machine, according to its nature, will feel the deficiency.

Give, on the other hand, a due proportion to this fluid, and all the different fluids, all the various solids derived from it will be strengthened in their various actions. Restore that which is lost, and we restore the machine to its vigour. If by inspecting any of the parts

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we

or by previous sickness, has always pale blood: the most superficial eye can discover this. The red particles are as constantly found where vigour is present. It would appear from this, that these particles are with more difficulty composed by nature, than the other parts of this fluid. This conclusion follows from the previous observation, that in debilitated habits they are scanty.

we can discover what is deficient ; if by certain symptoms we can be led to a proper conclusion our work is nearly done. The intimate connection of oxygene with the habit, and with life, the important purposes which it is destined to perform, render the deficiency instantaneously felt. Its restoration is ease, repose, vigour, health. This substance supplied to the habit I would denominate a true and *direct* narcotic, in contra-distinction to opiates and other analogous materials, the primary action of which being exhaustion ; I would, for the same reason, term *indirect* narcotics.

A middle aged man, in health, will consume two gallons of pure oxygene air in about five minutes, as repeated experiments have proved. In this instance however it is done more rapidly, and the expenditure greater by one half than is necessary : for if these two gallons be mixed with two gallons of azotic gas, it will serve for respiration *ten* instead of five minutes. Here we see how easily the body may be rendered replete with oxygene ; how easily we may supply a deficiency of oxygenation.<sup>u</sup>

A

<sup>u</sup> When oxygene is imbibed by the blood, it circulates to the extremities of the arteries, and is there deposited ; it then



A comparison between hydrophobic blood, and some taken at the same time from a healthy person, placed in the same degrees of heat, would throw light on its nature. It would be seen which was most prone to putrefaction; which threw out most serum; which coagulated in the shortest time; which had the firmest crassamentum; which the most fibrous matter; which the most alkaline parts, with the difference in  
con-

then combines with substances for which it has a greater attraction than it has for the blood; for it would appear from this to have only a loose cohesion with the blood. In its combination at the extremities of the arteries it parts with its caloric, which becoming sensible, produces animal heat. All the heat is not given out in the lungs on the union of the oxygen with the blood, but both heat and light enter with it into the left ventricle, to be distributed by the arterial circulation to their extremities.

The blood constantly returns in the veins deprived of it, and receives a fresh supply in course, at the extremities of the pulmonary arteries, where it is attracted through the air cells by this fluid: for oxygen is even found to enter blood out of the body though a bladder be interposed, a substance of much greater consistence and thickness than the membrane forming the air cell. The muscles and moving fibres of the body in this manner receive oxygen, which, combining with them, communicates firmness and strength.

Heat therefore is produced in every part of the body where action of parts takes place, and new combinations are made; and this will be in proportion to the degree of activity in the part. Can we trace, in this link, the cause of increased heat in local inflammations?

consistence and colour; and if farther chemical tests were thought necessary, the enquirer would not rest satisfied here, but would prosecute the subject more intimately. From the result of such examinations we might be better enabled to determine the propriety of modified atmospheres.

Some think the stomach,<sup>v</sup> not the organs of respiration, the properest channel by which medicines can be conveyed to the habit. Allowing this as a general rule, which we know here to be Nature's law, cases will offer, and these many, where serious obstacles will oppose themselves. Dr. Beddoes and his correspondents have given undeniable proofs, that the application of remedies through the respiratory organs, howsoever uncertain on some occasions in their operation, may be rendered neither difficult in the execution, nor deleterious to the patient; and that the prosecution of pneumatic medicine, as it will bear varying in a thousand modifications, may not only be highly efficacious, but even a more certain and speedy way of affecting the blood, and general habit, than through the stomach.

The

<sup>v</sup> Vide Rollo's Minutes of a Diabetic Case.

The state of this organ in Hydrophobia precludes, in a great measure, the immediate application of remedies to its coats. The difficulty of deglutition, and the dreadful paroxysms not only occasioned by the effort itself, but by the very sight or mention of substances to be swallowed, are a still more powerful obstacle. The lungs are free, and no obstacle presents to inspiration. In some of the cases we find a rude attempt or two at modified atmospheres, by burning frankincense, and other gums in the chamber, which the patient inhaled without difficulty. There is indeed in every case a distressing sense of suffocation, sometimes threatening immediate death, occasioned by the spasms of the heart, as would appear, interrupting the passage of the blood, but it yields with the paroxysm.

If all the phenomena of the disease be reviewed, and we can rely on the appearances of putrefaction after death which have been affirmed, the vital air modified to our purpose would seem better adapted to a cure than the other species of elastic fluids. Great exertions create proportionate debility by the expenditure of this principle. No disease, no condition of the body has been seen, where greater exertion,  
or

or greater distress of the mind takes place. The exhaustion must be in proportion. Great temporary exertions indeed of muscular motion have been made in Hydrophobia, without apparent inconvenience, nay even with some momentary relief of a distressing symptom, but they were the last efforts of expiring strength. This is arguing however from an effect, not from the cause of the disease. The poisoned saliva may possess the power in itself, like opium, of exhausting the frame, and creating a morbid deficiency of the vital principle, beyond what is known in other diseases.

If it be oxygen that gives power to muscular motion; if its absence be weakness, we cannot doubt but a condition of the body is present in this disease, containing a far less portion of this principle than is requisite for the standard of health. If this speculation be permitted, the mode of relief lies before us, and air supercharged with oxygen affords it. We have seen that this can be done with safety.

Dr. Priestley, the first human subject, I believe, who ever inspired oxygen gas in a state of separation from the atmosphere, after continuing



tinuing its inspiration, instead of experiencing inconvenience, felt his breast lighter and easier from it. The experiment however has since been more completely confirmed.

Taylor, a healthy young man of 22 years of age, respired it, with sensations equally pleasant, under the eye and management of Dr. Higgins.<sup>w</sup> His pulse was increased from 64 to 90. It became at the same time fuller and stronger, without the smallest sensation of uneasiness, or inconvenience.

Lime-water was judiciously prepared to absorb the carbonic acid emitted in expiration, as fast as it was generated. Nineteen pints of gas was the quantity, and six minutes the time employed. On this being finished, an equal quantity was added, and again consumed in the same time. His pulse was now increased to 120, and was vigorous. Notwithstanding this increase even to a high febrile number, yet no inconvenience was sustained; but he felt a sense of unusual warmth in his lungs. This nevertheless will suggest a caution, pointing out the necessity of watching the pulse, and suspending the exhibition of the gas for a  
limited

<sup>w</sup> Vide Minutes of a Society for Philosophical Experiments and Conversations, p. 146.

limited time, least inflammatory and dangerous symptoms should ensue.

In the experiment under consideration, one hour's interval brought back the pulse to its first standard of 64. This would suggest also the time for repeating our dose ; but in this we may err : experience only can determine it. In Hydrophobia, where a few hours become of the highest magnitude, frequent repetition of an useful remedy will be proportionally important : long intervals, and under doses may bring our remedy into discredit, by the patient's loss of life, while more judicious doses might have produced happier effects.

It would appear likewise that different persons are differently affected by oxygene, as indeed they are by every other medicine. Where it is found to disagree, or to be in any respect injurious, this can readily be removed by exhibiting it in a less concentrated state. Let it be diluted, and different results will follow. The degree of strength must most certainly be tempered to the individual, measured by our own observations on his pulse, and by his feelings.

Mr. Atwood's case, among others, will prove the advantage to be derived from oxygene in  
most

most dangerous situations.<sup>x</sup> It may be said, that there are no sphacelating sores in Hydrophobia, as happened here. The dissections however already detailed prove both stomach and œsophagus to be ulcerated, and these of a spreading erysipelatous nature, tending as speedily to fatality as the ulcer on Mr. Atwood's leg. We have seen from some symptoms that have occurred in Hydrophobia, such as violent craving for food, and devouring it greedily, and the ulcerated condition of the stomach itself, the morbid alteration of the gastric juice. We observe the same in Mr. A.'s case, and we find them removed by an hyper-oxygenated atmosphere. We find likewise a constant and unconquerable watchfulness in Hydrophobia; Mr. Atwood had long experienced the same, but on the second day of inhaling the vital air----“passed the sweetest night! such as I am sure,” adds he, “I have not enjoyed these four years.”<sup>y</sup> Other instances are recorded, where the same happy effects followed its use.<sup>z</sup>

Mr.

<sup>x</sup> Vide Beddoes's Considerations, vol. 1, edit. 3.

<sup>y</sup> Atwood's Journal, *ibid*.

<sup>z</sup> Hydro-carbonate gas has been recommended for inducing sleep. Mr. Barr we have seen strenuously to contend

Mr. Boothby, after breathing vital air the first time, "slept better the first night than he had done for seven months." Disease asthma.

Mrs. Barratt, who was cured of asthma by vital air in six weeks, slept well from the first day

tend for it. Here he is followed by Cavallo, who is led to this from the property it possesses of producing insensibility to pain, of diminishing irritability of fibre, and thence of the probability of its proving a remedy in rabid hydrophobia.

As a temporary narcotic I shall not object, if the distressing watchfulness, which constantly attends this disorder, cannot be removed by the use of oxygene. For the reasons already delivered, its use would appear ill adapted to any thing farther than a temporary insensibility. But should it prove in this respect superior to opium, it ought not to be rejected.

Vertigo is almost a constant attendant of its exhibition; but a lightness about the breast, as if the part was totally removed, is likewise experienced. A person who inhaled it expressed his feelings by saying he had nothing left about him but his head. If diluted from twenty to thirty times, it may be inhaled without danger. I do not see the impropriety of occasionally inhaling it at the same time with oxygene; I mean for the purpose of procuring rest.

For inflammatory diseases it has proved an useful remedy, even superior to V. S. (vide Cavallo's Essay on Factitious Airs) but it has been shown in another place, that little or no inflammation accompanies Hydrophobia. Hydro-carbonate also is subject to an inconvenience, from its producing a recurrence of vertigo and faintness, frequently returning at uncertain intervals, without a renewal of the dose.



day she breathed it. The quantity she breathed was two quarts vital, and thirty atmospheric air.

Dr. Redfearn's patient, an asthmatic lady, breathed sometimes a cubic foot of vital air undiluted. She slept very soundly always after it. The sensation felt from it was a glow, like what is experienced from peppermint water. She continued this plan, for four months, with great relief.

Mr. Phipps adds his testimony in a case under his care, where vital air procured good sleep, with removal of great and constant pain, where opium, in doses of 112 to 120 drops gave only some temporary ease, with a little unrefreshing sleep. The quantity breathed, and the proportion, was from one to two quarts of vital, to eighteen of atmospheric air for a dose.

Mr. Danby, who was affected with paralysis, from drinking port wine at an inn impregnated with sugar of lead, received such benefit in the course of a week, from inspiring oxygen, that along with restored motion of his hands, of which he was totally deprived, from sleepless nights they were sound and refreshing. The dose was two quarts of vital air to  
forty

forty atmospheric : when a larger portion was used it was hurtful, by producing pains over the body.

Mr. Alderfon's patient, a chlorotic young lady, could not sleep : she took vital air, even a quart undiluted at a dose : she not only slept well afterwards, but could not sleep without it.<sup>a</sup>

In the removal of convulsions, which are so excruciating in Hydrophobia, especially convulsions of the diaphragm, oxygene has given happy relief. In these cases we have hitherto fled to opium, and for the most part have been disappointed ; and in other diseases affecting this organ the same disappointment has followed. No less than 300 drops of laudanum, in

<sup>a</sup> In the preceding review we have seen hydro-carbonate gas induce sleep ; in the present here are many instances of oxygene eminently possessing this power. How are these to be reconciled, since they are substances of an opposite nature ? This difficulty will be solved, in some measure, by reflecting on the nature and causes of irritability under different states of the habit. Irritability preventing sleep, proceeding from *direct* debility, is removed by tonics and corroborants, and by oxygene as one of these. *Indirect* debility, accompanied with high irritation, proceeding from previous action morbidly increased, will be removed by hydro-carbonate gas, lowering the state of action, and suspending for a time sensibility to stimuli.

in diaphragmatic spasms, have been administered; but it rendered the patient frantic, without procuring a cessation of the convulsion. Oxygene was inhaled and a speedy cure succeeded; yet the disease was inveterate, from a three year's duration, and singularly distressing in all its paroxysms, and with daily reiteration.<sup>b</sup>

Mr. Phipps testifies to the use of vital air in removing violent spasms. We find dyspnœa, and palpitation of the heart, greatly relieved by it.<sup>c</sup> To a certain degree these form part of hydrophobic distress. We have seen in every history of the disease, from the earliest to the latest times, an aversion to contact with cold air: oxygene imparts warmth, and gives a disposition to the body to resist cold. We find it capable of being absorbed by the skin, and capable in this way of affecting the system. When it is introduced into the cellular membrane of animals, it is not only absorbed, but more rapidly absorbed than the other gases, in this way producing hilarity and cheerfulness.<sup>d</sup>

We

<sup>b</sup> Vide Beddoes's Considerations.

<sup>c</sup> Ibid passim.

<sup>d</sup> Vide Dr. Maxwell's Thesis Edinburgh, 1787.

We have seen timidity and melancholy, in like manner, the constant concomitants of this disease: we find them removed, at least to a certain degree, by imparting to the habit a greater proportion of vital air. In a word, we can discover, even from the confined experience we already possess, several other symptoms, forming a part of Hydrophobia, and arising from an exhaustion of oxygene, yield to its re-introduction. Here might be recited a great number of the species of spasmodic disorders.<sup>c</sup>

No difficulty attends the application or preparation of factitious airs, with a proper apparatus. "To procure," says Dr. Beddoes, "a dose of factitious air, by means of Mr. Watt's apparatus, will, I think, be found more easy than to dress a joint of meat. In several instances under my eye, a servant of plain understanding has managed the apparatus perfectly: in one, a maid servant has proved quite equal to the task."

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<sup>c</sup> Should it be found expedient to make the trial (a trial at all events is worthy of prosecution) it may be necessary to suffer the oxygene gas to stand some time in the vessel after preparation, before using, to deposit the particles of suspended manganese to subside.



In administering oxygene air it would perhaps be advisable to begin with small doses, repeating them frequently, gradually augmenting the quantity and strength. In several cases<sup>f</sup> five parts to thirty of atmospheric air were the proportions used.

Mary Leucraft inhaled thirty quarts of atmospheric air, mixed with two quarts of vital air. This appears to have been her daily dose: no inconvenience followed. She was cured by this plan. Her disease was Ascites.

The lad Mead inhaled daily two quarts of vital air, diluted with thirty-six of atmospheric, without inconvenience, and with benefit. His disease was Hydrocephalus. The blindness which took place from the pressure of the water on the origin of the optic nerve, was removed in three days, a proof of its action on the absorbents of the brain.

Sir William Chambers inhaled two quarts of vital air, diluted with fifty of atmospheric, every second day for two months, without injury. Here it may be observed, that a quart can be taken in at a full inspiration.

Mr.

<sup>f</sup> Vide Beddoes's Considerations.

Mr. Barbar inhaled one quart of vital air, mixed with nineteen quarts of atmospheric, daily for some time; and afterwards two quarts of vital air daily, mixed as above, without inconvenience, and with a complete cure of Hydrothorax in four weeks.

Dr. Darwin's patient breathed daily eight gallons of vital air, with the same quantity of atmospheric, procured from Exeter manganese; and afterwards the same quantity without mixture, experiencing no inconvenience.

Mrs. Barker inhaled vital air in the proportion of two quarts of vital to sixty atmospheric air. Her disease was a Cancer.

These are a few of many instances of the safety, as well as utility of inspiring this gas.

Mr. Watt, from his experience, observes, that small doses, while it obviates every idea of danger, would appear best suited for its communication to the blood, and consequently of reaping its full advantages;<sup>2</sup> for when it was inspired in large proportions the greater part of it was again returned by the next expiration, and lost, while a more gradual method of

<sup>2</sup> The same has been observed of hydro-carbonate gas. Vide page 90.

of receiving it into the air vessels of the lungs insured its absorption into the system.

These cases will farther prove how advantageously it may be applied to quicken the absorbents, and check diseased secretions. This is an effect which we find tonics generally produce; hence oxygene may be considered as a tonic. If we view it in this light we may have hopes, from its quick and sudden action, of the speedy stop it will occasion to that morbid and abundant secretion of the stomach and œsophagus, with perhaps the salival glands, so distressing to the patient, and so universally present in every hydrophobic case.<sup>h</sup>

Dr. Beddoes observes, that sometimes by restoring the activity of a languid part, it removes the sensation; and sometimes by diminishing sensibility, or giving general energy to the system, it destroys habits of morbid action.

### 1      Three

<sup>h</sup> If it be given undiluted, and in large quantity, so as to raise sudden inflammation, the great activity induced on the vessels creates a proportionable secretion, and mucus in these cases will be more than commonly abundant. This took place in an experiment where a kitten was immersed in oxygene gas, and where the lungs were found inflamed, and the throat and fauces stuffed with mucus.

Three or four days, it is true, are but a short period for the trial of this remedy, in which Hydrophobia runs its course ; but an objection of this kind will lie more forcibly against every other medicine, because none can so immediately enter the general habit, or so immediately show its active powers. This activity will appear from the changes which even a few doses produce on the general habit. Animals immersed in it but for a short time, had thereby their muscles rendered firmer and harder ; and after inspiration, if directly killed, their blood coagulates almost instantaneously.

I have ventured thus to hazard a conjecture on the probable good effects of oxygene in the cure of this disorder ; I have ventured it from a consideration of the futility of every means of relief hitherto adopted ; I have ventured it perhaps more on the principles of empiricism, than on just induction from the nature of the complaint ; but who is the investigator hitherto able satisfactorily to arrive at it ! I have hinted this opinion under the supposition of hydrophobic virus entering the system, and by a certain *modus operandi* difficult to trace in every link, creating a certain set of actions, and inducing changes, of which the abstraction of oxygene  
may



may form the principle. I would not however be understood as advising the inhalation of factitious gases to supersede the use of those substances denominated *tonics*, remedies extolled by the latest, and most philosophic writers on this disease.

Arsenic especially I would recommend as one of the most powerful tonics perhaps yet discovered. The use of this, and the inspiration of modified airs may proceed together. They are applied to different surfaces, and in the exhibition will not interfere. If difficult deglutition should give an opportunity (and in many instances we find it partially overcome) the medicine may be exhibited, whether alone or in combination; either in some substance finely levigated, as in the Tanjore pill; or in aqueous solution, or involved in other forms, in crumbs of bread.

I have said nothing respecting applications to the superficies of the body, unless what is hinted under the head of bathing and frictions. But the diseased sensibility of the skin, evident by the uneasiness expressed on the gentlest motion of the air, and often on the slightest pressure of the bed clothes, would indicate the propriety of some external application,

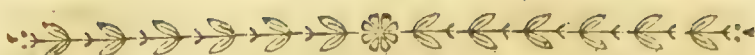
tion, as a defence against these noxious powers, especially the former.<sup>i</sup> Is the absorption of the skin increased or diminished? Are the secretions and excretions proportionally greater than what is imbibed by the surface from the atmosphere? Queries of this nature may be termed a needless curiosity; but it is a curiosity laudable, since we should attempt to discover every thing; and there is no insurmountable obstacle or difficulty in the way of obtaining such information.

Having brought these observations, relative to the cure, before the reader, I leave them to his consideration. They are indeed imperfect, and perhaps he may with justice complain of my leaving the subject nearly in as much

<sup>i</sup> If hydro-carbonate gas be admissible in this disease, it is possible that the application, in form of an air bath, might be a means of meliorating the diseased sensibility of the skin. Appropriate contrivances (of no difficult invention) would render it easily applicable. It may be thus confined in the vessel a considerable time without mixture with the atmosphere. The patient being set in a vessel, with his head beyond the reach of the gas, to prevent its entering his lungs, might remain in this position ad libitum. When this species of gas was applied to a part deprived of cuticle, the smarting pain immediately ceased, and insensibility followed, which as constantly recurred when the sore came in contact with the common air.

much uncertainty, in this respect, as before my investigation. He will allow however the task of complete elucidation to be arduous, and I am willing to acknowledge much of the uncertainty which he may attribute to me.

SHORT



## SHORT RECAPITULATION OF THE MEANS OF CURE.

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THE disease, it is admitted, is seated principally in the nervous system. Debility seems to form its characteristic.

Two stages are apparent in its course; a first, or incipient; and a second, commencing with Hydrophobia, and ending in death.

The disorder is capable in the first stage perhaps of cure; but never yet performed in the second.

1st. *Emetics*. The first means of relief it has been thought should be by emetics; the reason given is from an appearance of bile in the primæ viæ; but emetics are improper in a  
com-



complaint of direct debility. They add to irritation, seldom diminish it, unless by the removal of obstructions in the vessels by the force of concussion; or by the opening of the pores of the surface to give an exit to retained perspiration; but the latter is not indicated in *Hydrophobia*.

*2nd. Cathartics.* These are little better adapted to the removal of this complaint, than emetics. They are detrimental in cases of debility, and often improperly exhibited here. Fætid stools are no test of their utility; no guide for persisting in their administration. A gentle cathartic is admissible here, as in other diseases of debility; but farther it would be improper to prosecute them.

*3d. Injections.* These are far less exceptionable, nay are often necessary, seldom debilitating; and may be the medium for introducing medicines, or for nutriment, or for both.

*4th. Bathing.* Neither the hot nor cold bath have ever been successfully used. The former, though it gives temporary relief in some instances, soon loses its effect. The latter, though carried almost to drowning, produces no better consequences. Death has even been hastened  
by

by plunging the patient into cold water. This conclusion is drawn from many trials.

Cavallo hints at some cases,<sup>k</sup> said to be cured by opium and cold bathing; by sudden submersion, almost to suspension of life; but he cannot remember respecting their authenticity; whether he read of them, or whether the communication came from the relation of some friend. It was most probably the former, for books tell of such cures; but if cases of Hydrophobia have been removed by this means, they were not *rabid*, but *tetanic* instances. They were convulsions, and difficult deglutition, arising from tetanus, not from the poison of a rabid animal.

5th. *Sudorifics*---*Stimulants*. Sudorifics are even less adapted to give relief. Volatile alkali, whether as diaphoretic, or merely stimulant, is likewise proved delusive. More however may be said for this, than for several of the others, and the practitioner would do well to give it a fairer trial than what has yet been done.

The use of the nitric acid has been suggested, which merits consideration.

6th.

<sup>k</sup> Vide Essay on the Medicinal Properties of Factitious Airs. p. 109.

6th. *Venæsection.* None of the remedies ever proposed in this disease has been more abused than *Venæsection*. None has proved less useful, and none so universally employed, in spite of its constant failure, which ought to have long ago created doubt. One man followed another in the same beaten tract, without inquiry; but false theories of the disease, not less than the repeated authority served for its support. In every rabid case it is objectionable, nay even in tetanus, or *Hydrophobia* arising from tetanus. None more suddenly creates depletion; and the disease now under review is marked in a peculiar manner with debility.

7th. *Blisters.* Whether they be used in their capacity as such, or in their more partial capacity of rubifacients, they are admissible to a certain degree; but their limits are circumscribed from the nature of their operation, and when they are to be applied, require attention, that abuse may not follow, where at least some use may be derived, under proper modifications. The assistance is found to be slender.

8th. *Embrocations*, which are something of the same nature, if sufficiently stimulant, may be applied to the throat, the pit of the stomach, and above all to the spine. They will stimulate cutaneous vessels into greater action, and  
may

may meliorate the diseased sensibility to cold air, by their causing, from their stimulant power, a change in the mode of action, and consequently extrication of more heat.

9th. The intemperate and vexatious persuasion of the patient to swallow drink, is altogether improper. Curiosity is here gratified at the expence of increased misery, to a most commiserable object. Antipathies, were it nothing but antipathy, to certain substances, in every species of disorder, are to be regarded.

10th. *Mercury*. This famous remedy, on which so much of late years has been written, may be dismissed, without regret, from the remedies of Hydrophobia. Not an instance of success can be fairly brought forward to support its claims.

11th. *Running*. It must be obvious, that in running, or violent exercise, a truly slender solace is set forth. If we consider its operation, it would seem to establish a point in pathology of no small magnitude; it is a clear indication of the patient's general weakness. It proves a deficiency of due sensibility in the heart; and that the ordinary stimulus of the blood is no longer able to give a force of systole equal to the propulsion of the contents with appropriated



priated energy, through the arterial system. Hence stagnation in the pulmonary system, sense of suffocation, &c. which running, as an increased stimulus, temporarily removes.

*12th. Cold.* The application of cold, or more properly, sudden abstraction of heat, to benumb the parts, and stop oscillation and irritation, it is evident; cannot be permanently useful; because, if continued, the death of the part must follow. The same objection may be brought against ligatures; yet these will admit of application to a certain degree, till more effectual means, for removing irritation in the part, can be prepared.

*13th.* This is its destruction, by the knife, by cautery, or by caustic alkali. Let this be accomplished at the moment when sensations of pain, or apparent inflammation give warning of the approaching malady. I am not without hopes, that by proper attention to this symptom, the disease may be checked in its commencement.

*14th. Oil.* This has been tried, with no advantage, in rabid Hydrophobia. Its use, even in Hydrophobia from fear, is problematical. It is not clear but that the patients, to whom it has been apparently successfully administered,

stered, would have recovered from the *panic* under which they laboured, had it never been applied.

15th. *Vinegar*. Vinegar, in this country, has been equally futile.

It is no new remedy; the practice is of ancient date. *Æschrion*, preceptor to *Galen*, exhibited crab's-claw powder against the disease; and *Galen*, who followed his master's practice, gave the same powder internally, and used it as an application to the wound, with the addition of frankincense, oppoponax, and gentian root, mixing them together with the *sharpest vinegar*.<sup>1</sup>

The oxalic acid I have ventured to hint at, should an acid be thought beneficial, as better adapted, from an idea that the quantity of oxygene in a given bulk is greater, and that its cohesion with its base is looser, and more readily separable, than that of the acetous acid or vinegar. But the practice cannot be enforced on the ground of experience, as it has never been attempted.<sup>m</sup>

16th.

<sup>1</sup> Vide *Galen*i Opera.

<sup>m</sup> Vide *Bergman*'s Essays, vol. 1, page 304. Take of pure refined sugar, finely powdered, one ounce; nitrous acid

16th. *Antispasmodics*. The class of antispasmodics, as distinguished by this name, have not answered. Opium, the most powerful, instead of proving useful, appears to have been detrimental under every management hitherto adopted. I apprehend that its use must be very guarded, to prevent the mischief attendant on its abuse. I am inclined to discard it entirely.

17th.

acid three ounces. Put them in a glass retort, or any glass thin enough to bear a moderate heat. When the solution is completed, and the phlogificated part of the nitrous acid has flown off, lute on a receiver, and gently boil the solution.

When the liquor becomes of a dark brown colour add the same quantity of acid as before, and continue the boiling till the smoking and coloured acid has entirely disappeared. Pour the liquor in the receiver into a large vessel, and upon cooling, small quadrilateral crystals will be formed. These are the oxalic acid, or acid of sugar.

We have Bergman's authority for affirming this acid to belong likewise to the animal kingdom. It has been discovered (vide page 66 and 92) to be a constituent part of the blood. It may possibly therefore be morbidly abundant, or morbidly deficient. Nothing is more easy than the process for obtaining this acid; but should it ever be attempted as a remedy in this disease, it may now be purchased at every druggist's. It is an expensive salt; but were it useful, this consideration would not weigh against its exhibition.

17th. *Hydro-carbonate Gas*. Some late writers, Mr. Barr, and Cavallo after him, have suggested the use of the hydro-carbonate gas, to remove irritation, and to induce sleep. I have ventured to state objections to it as a general remedy, though as an auxiliary, in a limited degree, it is worthy of a place; but from its great activity, i. e. from its sudden effects, and these of a most powerful kind, tending almost to immediate death in an imprudent dose, the practitioner must use the utmost caution in its administration. In producing temporary cessation from pain, where pain is excessive, it appears to be powerful.

A bath is suggested of this ærial fluid, with a view to obtund cuticular sensibility, so excruciating in Hydrophobia. For this purpose a narrow tall vessel, such as a small cask, may be procured, into which the patient may be put, keeping his head above the cask. Into this the hydro-carbonate, previously prepared, may be introduced; for no great difficulty will obstruct the management, when it may be confined in the cask by cloths, or soft chamois leather, surrounding the patient's body, and preventing its mixture with the atmospheric air.

This



This however is an employment of some danger to the assistants, and to the patient, in the act of extricating him from the vessel, to prevent its admixture with the air of the room, which may create, to say no worse, vertigo and head-ach. It ought to be done near a chimney, that it may be carried up by the current. A commodious contrivance, air tight and secure, for such a bath, would not be difficult to invent.

This perhaps is not the only species of disease to which such ærial immersion may be confined. Might it not be employed with advantage in cases of severe burns, whether produced by explosions of gun-powder, or of hydrogen gas, in coal pits and other mines, or by scalding with boiling fluids? Its property of destroying sensibility, of mitigating severe pain, favour this suggestion: Burns are accompanied with most excruciating pain.

18th. *Tonics*. This class of remedies is not only unequivocally admissible, from the pathology of the disease, but strenuously to be inculcated. The disease is strongly marked by debility, which tonics as strongly oppose. Bitters are many of them tonics; but vegetable bitters are bulky, and in a powdered form at least

least the stomach here will reject them: even decoctions, for the same reason, are objectionable. The metallic tonics are therefore preferable: iron, zinc, copper.

From the mineral kingdom another substance has been lately recommended.

19th. *Arsenic*. This substance merits the highest attention, and promises no small advantage. It is strange, that till lately this could not be mentioned in medicine, without exciting great apprehension and terror; yet poisons not less deleterious, viz. preparations of mercury, of antimony, and even opium itself, were in daily use with the faculty. In the form of a pill, named tonic or Tanjore pill, this mineral has been exhibited both against the bites of serpents and rabid animals. From it high expectations are now entertained.

20th. *Oxygene Gas*. Under the head of tonic medicine I would class oxygene gas, or vital air. Its use I have here recommended, from the persuasion of too great a subtraction of it from the habit, created by the force of the poison in what way soever it may operate. The mode of exhibition is of late made considerably easy by the labours of the ingenious Beddoes. This active substance is not introduced  
here.

here as a catholicon, but as an assistant to other endeavours, especially in co-operation with tonics.

Such are the suggestions which have occurred in reviewing this malady, and which the pathological reader is earnestly requested to re-consider. Let him sedulously render his aid in bringing them to perfection, or, by pointing out other means more certain, remove their ambiguity and establish the safety of mankind against a disorder deplorable and incurable, from its first discovery in remotest antiquity, to its latest instance of fatality.

*An Assertion relative to the earlier or later  
Commencement examined.*

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SAUVAGES<sup>n</sup> affirms, that Hydrophobia commences sooner when a bite is received in the face, than when inflicted in a lower, or more distant part; and he is followed here by Van Swieten. This has been referred by others to the salival glands, affirming it to be a fact, that the nearer the wound is to their seat, the sooner proportionally will the disease follow. With a view to ascertain this a few cases are collected, wherein the time of the bite, the time of accession, and the part wounded are pointed out. The examples adduced are indeed too few to establish a general conclusion, but no more are afforded by the books to which, at present, I have access.

As

<sup>n</sup> Vide Dissertat. sur la Nature et Cause de la Rage, page 4.



As far as they go the result militates against the assertion; nor am I without doubts whether it could be established were even a much greater number of cases collated.

I have thrown them here into a tabular form, that the eye may at once examine the proportion, and estimate the difference. They are arranged in three classes of wounded parts.

*1st.* Wounds received on the head, face, neck, before or behind.

*2nd.* Those received in the upper parts of the trunk, comprehending the breast, shoulders, before and behind, with the upper extremities from the shoulders to the ends of the fingers.

*3rd.* The under part of the trunk of the body, comprehending from the epigastric region downwards, back, loins, and hips, with the lower extremities from the top of the thigh to the ends of the toes.

## T A B L E.

*1st. Wounds on the Head, Face, and Neck,  
before or behind.*

| No. | Patients.           | Parts bitten.               | Distance.  |
|-----|---------------------|-----------------------------|------------|
| 1   | A lady at Modena    | lip                         | - 50 days  |
| 2   | Mr. Turner's        | - cheek                     | - 23 days  |
| 3   | Dr. Mead's 1st      | cheek                       | - 32 days  |
| 4   | John Brown          | - { cheek and<br>shoulder } | 4 months   |
| 5   | ----- Bean          | - shoulder                  | - 26 days  |
| 6   | ----- Nourse        | - cheek                     | - 30 days  |
| 7   | Dr. White's 4th     | cheek                       | - 1 month  |
| 8   | Aldersgate Dispens. | cheek                       | - 2 months |
| 9   | Poncelin's          | - { face, head,<br>&c. }    | 32 days    |
| 10  | Middlesex Hosp.     | cheek                       | - 25 days  |
| 11  | C. Bullock          | - cheek                     | - 37 days  |
| 12  | Master Rowley       | - lip                       | - 36 days  |
| 13  | ----- Macey         | - right ear                 | - 20 days  |
|     |                     |                             | 14 -----   |

| No.      | Patients.       | Parts bitten.                    | Distance. |
|----------|-----------------|----------------------------------|-----------|
| 14 ----- | Cobb            | - cheek & lip                    | 11 days   |
| 15 ----- | Johnfon         | - cheek -                        | 3 months  |
| 16       | Stephen Race    | - face & lips                    | 6 weeks   |
| 17       | Francis Tweed   | { throat, cheek, }<br>and chin } | 20 days   |
| 18       | Jeremiah Groves | breast & neck                    | 96 days   |
| 19       | At Coggeshall   | - face -                         | 3 weeks   |
| 20 ----- | Niece           | - { face, arm, }<br>& ankle }    | 18 days   |
| 21       | Samuel Smith    | - eye-brow -                     | 45 days   |
| 22 ----- | Briquet         | - cheek -                        | 58 days   |
| 23       | Jean Petit      | - head, face, &c.                | 52 days   |
| 24       | Jean Arbelot    | - cheek -                        | 68 days   |
| 25 ----- | Castinel        | - lip -                          | 60 days   |
| 26       | Dr. Thieffet's  | - head -                         | 58 days   |
| 27       | Dr. Dupleffis's | { cheek, arm, }<br>& thigh }     | 3 months  |
| 28       | Louis Michaut   | - cheek -                        | 3 months  |
| 29       | Cath. Champion  | cheek & lip                      | 1 month   |

*2nd. Wounds in the upper Part of the Trunk,  
viz. Breast, Shoulders, before and behind,  
with the upper Extremities.*

|   |              |          |         |
|---|--------------|----------|---------|
| 1 | James Corton | - hand - | 6 weeks |
| 2 | Dr. Howman's | - hand - | 6 weeks |
|   |              |          | 3 Dr.   |

| No. | Patients.              | Parts bitten.  | Distance. |
|-----|------------------------|----------------|-----------|
| 3   | Dr. Mead's 2nd         | - finger -     | 66 days   |
| 4   | _____ 3rd              | - hand -       | 3 months  |
| 5   | Student of physic      | - finger -     | 1 month   |
| 6   | Stephen Bellas         | - thumb -      | 19 months |
| 7   | ----- Christy          | - hand -       | 6 weeks   |
| 8   | Dr. Munckley's         | - hand -       | 39 days   |
| 9   | Dr. Dickson's 2nd      | - arm -        | 4 months  |
| 10  | James Patton           | - hand -       | 12 weeks  |
| 11  | Dr. Vaughan's 2nd      | finger -       | 9 months  |
| 12  | _____ 3rd              | wrist -        | 1 month   |
| 13  | Dr. White's 1st        | - wrist -      | 1 month   |
| 14  | _____ 2nd              | - wrist -      | 1 month   |
| 15  | Abraham Palmer         | - hand -       | 38 days   |
| 16  | Dr. Berkenhout's       | - arm -        | 6 weeks   |
| 17  | Mr. Dawfan             | - thumb -      | 6 weeks   |
| 18  | Henry Rider            | - wrist -      | 18 months |
| 19  | ----- Middleton        | - hand -       | 12 days   |
| 20  | At Edinburgh           | - hand -       | 72 days   |
| 21  | Mary Strong            | - finger -     | 2 months  |
| 22  | Marie Guittard         | - hand -       | 31 days   |
| 23  | François Ethéveniot    | wrist -        | 44 days   |
| 24  | Man-cook               | - palm of hand | 40 days   |
| 25  | Dr. Mignot de Genety's | arm -          | 1 month   |
| 26  | Sieur Gravan           | - hand -       | 38 days   |



*3d. Wounds in the under Part of the Trunk of the Body, from the epigastric Region downwards, with the lower Extremities.*

| No.     | Patients.          | Parts bitten.                 | Distance. |
|---------|--------------------|-------------------------------|-----------|
| 1 ----- | Boyer              | leg                           | 74 days   |
| 2       | George Pollock     | leg                           | 3 months  |
| 3 ----- | Bellamy            | leg                           | 4 months  |
| 4       | Dr. White's 3rd    | leg                           | 26 days   |
| 5       | John Slight        | leg                           | 60 days   |
| 6       | Dr. Gray's         | thigh, arm, & back            | 24 days   |
| 7       | Thomas Hogg        | { right leg &<br>right hand } | 27 days   |
| 8       | Elzeard Roche      | foot                          | 46 days   |
| 9       | M. A. Proghammerin | ankle                         | 60 days   |
| 10      | An Advocate        | ankle                         | 6 months  |
| 11      | A Mason, aged 16   | leg                           | 56 days   |
| 12 ———— | aged 22            | leg & arm                     | 8 months  |

In the first class are 29 examples, of these are no fewer than 21 from one to four months, of whom twelve are wounded in the cheek, and four in the lip. The cheek and lip are places almost contiguous to the salivary glands, yet

yet the patients are not attacked till a late period.

The second class contains 26 examples, 19 of which exceed a month. In this class we find the longest period of attack on record, viz. Bellas, bitten on one of the upper extremities.

The third class consists only of 12 examples, 10 of which exceed a month before the attack commences. The number in this class are indeed too few for our forming from them an accurate average.

On the whole, it will easily appear, that the observation of the above authors was vague and loose. Had it even been true, little practical use could have resulted from it; but as the fact stands, it serves to prove the salival glands to have no effect on the earlier or later commencement, which must be derived from some other law. This has already been investigated;° and it was there referred to the nature of the poison; its mode of infecting the body, and the constitution of the individual.

We find in this table, comprehending 67 examples, only 12 wounded on the lower part  
of

• Vide vol. 1.

of the body and extremities. That so few happen on the extremities arises from the habit of the animal in catching its prey.

The wolf always lays hold of it standing on his hind legs, suddenly throwing his fore legs on the breast or shoulders. The domestic dog, a branch of the same stock, for the most part leaps on the person or animal he wounds.

The cat likewise springs on her prey; but being small, compared to the wolf and dog, catches an inferior part, the leg, or the arm and hand, especially in a hanging posture.

In their rabid state they follow Nature's law, seizing the unhappy victim as they usually do their prey.

*Hydro-*

*Hydrophobia in Man not Madness, as usually styled; nor communicable by him----*

*Not communicable by other Classes of Animals, the Dog and Cat forming the Exception.*

*Violent Death in the human Hydrophobic unnecessary and cruel.*



THOUGH Tulp<sup>p</sup> many years ago, and after him several others, and some even of our English authors, as Vaughan, &c. pointed out the impropriety of denominating Hydrophobia madness; and though every history of the

<sup>p</sup> Opus non fuit, nec huic, nec aliis ægris (quos equidem vidi satis frequentes) mortem maturare, sive per stragulam, sive per culcitram ori (uti loquitur vulgus) impositam, quippe pereunt per se satis celeriter: utpote raro superstites, cum aquæ formidine in diem vel tertiam vel quartam; quibus addo, quod neminem hactenus, vel audiverim latrare, vel viderim mordere, necdum cuiquam detrimento fuisse rabidorum sputa. Vide Obs. Med. l. 1, cap. xx. p. 42.



the malady contradicts the idea, yet a contrary doctrine, long inculcated and long established, held the opinions of mankind, and to this day even in our own country, especially among the multitude, is far from being eradicated. The prevalent idea also of its communicability by man was another misfortune of a nature far from trivial.

Observe with what terror the minds of Stalpart and Themison were impressed on this head. The former constantly washing his hands to avoid the consequences which he apprehended from touching the pulse; and the latter tormenting himself, and swallowing medicines for an imagined disease.<sup>a</sup>

Nourse, but for the interposition of his humane physician,<sup>r</sup> would have suffered a violent death, from the idea of his madness; yet no case of the complaint more strongly proved the unimpaired state of the rational faculties. The progress of the disease redoubled his sufferings ---- “ he had all his complaints aggravated by the improper conduct of his attendants, who, prompted by their fears, had almost persuaded themselves, that the opinion  
univer-

<sup>a</sup> Vide Dissections, vol. 1,

<sup>r</sup> Dr. Vaughan.

universally received by the common people of smothering such unfortunate objects, was not only justifiable, but expedient ; for I found them," adds he, "confining the poor creature under the bed clothes ; by the united force of half a dozen strong assistants, whose countenances bespoke the terrible apprehension they were under." He was instantly set at liberty, and the people sternly rebuked ; but it rendered him afterwards (nor is it surprising) suspicious of those about him. This was in 1773.

By M. Portal's review of this disease, the same cruelty was practised in some parts of France very lately, before the year 1787 ;<sup>s</sup> and so late as 1794 a practice, though dissimilar, yet severe, was followed in our own country. John Edwards, who contracted the disease at this time, was bound in a strait waistcoat, and continued thus fettered for many hours, to the great aggravation of his sufferings, till another practitioner relieved him from his confinement.<sup>t</sup> Nor is this a solitary instance : consult the writings of the last twenty years, and several similar will be found.

Let

<sup>s</sup> Vide Analytical Review, vol. 1.

<sup>t</sup> Vide Gentleman's Mag. for the year 1795.

Let the enquirer however peruse the annexed cases,<sup>t</sup> and let him be convinced of the rationality in its full perfection, in respect to the wonted share possessed in health by every individual. It is true, the malady is often accompanied with dreadful exacerbations; so that for the time the patient is rendered incapable of governing his motions or actions, or restraining, in any degree, involuntary spasmodic exertions, into which almost every muscle of the body is thrown. During these it sometimes happens, that they resist the attendants employed in holding them in bed to prevent their being dashed, by the contortions of their bodies, on the ground, or from otherwise injuring themselves.

In these fits they have sometimes involuntarily scratched, and sometimes bitten the nurses or others; but this is no more madness, than the convulsive exertions of an epileptic, or an hysteric patient. Sometimes also the sufferer has been impressed with a notion of an evil intention in the bye-standers towards him. This has proceeded from the recollection of what he himself heard formerly on this subject. He  
is

is haunted with the horrors of an untimely death, by which he believes he is about to end his days, and this even by the hands of his relations, and those who should be his protectors, or sympathising administrators of relief. This conduct arises from an idea of self preservation, and the persuasion of the certain communication of the disease.

These fits of delirium are but of short continuance, and alternate with intervals of as much self command, as much rational observation as is observable in complete health. Strangulation, or smothering between two feather beds prevailed too much at one period, occasioned by mistaking the nature of the malady.

Van Swieten testifies to the permission of this cruelty even by the magistrates. This proceeded however from good motives, and a belief that it was better to suffer *one* to perish, than to endanger the lives of many. It seems to have arisen from a kind of analogical reasoning, unsupported by just observation, that as the dog and cat kind communicated it, so must man to man, when he became infected. This, I am persuaded, is not the fact. I can find no proof on which a person investigating truth



truth should rest, either that the saliva falling directly from an hydrophobic on an attendant, or even the actual bite which sometimes has taken place during the paroxysm, was ever followed by any inconvenience more than would arise from wounds given by other means.

It has been known, that persons have, without being infected, put their fingers into an hydrophobic's mouth, and drawn out, from time to time, the viscid saliva. The servant who attended Dr. Munckley's patient, with the corner of a handkerchief, roped out the tough mucus adhering to his fauces.

Dr. Bouteille confirms the observation of the innocency of handling the saliva of a person under Hydrophobia.<sup>a</sup> In the same work may be found an instance of an hydrophobic patient, whose attendants, without the least bad consequences, not only received his breath into their faces, but with their fingers roped the saliva from his mouth, and were even scratched by his nails. The same impunity does not take place when the fingers are introduced into the mouth of a rabid dog, a  
proof

<sup>a</sup> Vide Mem. de la Soc. Roy. de Medicine, ann. 1783.

proof of which we have in the instance of M. de la Pryme's patients.<sup>v</sup> "A nurse who was constantly with the child (Dr. Vaughan's third patient) who very often kissed it, and who repeatedly received its breath upon her face and mouth, has not experienced the least ill effect from it." But a gentleman who took the same liberty with a favourite dog under the disorder, by kissing it before it went to be drowned, suffered for his temerity.<sup>w</sup> This contrast deserves attention.

There are besides instances where an actual bite from hydrophobic patients has been received with the same impunity. In one case the bitten part was immediately extirpated: nothing therefore can be concluded from it; but the others are cases in point, against which no objection can be brought, and are strong negative proofs of my opinion, which, till a positive fact to the contrary, well attested, can be adduced, I must continue to hold.

I entertain at present the same opinion of its incommunicability by quadruped to quadruped, with the exception of the dog and cat kind, which I rest on the result of two or three  
expe-

<sup>v</sup> Vide Phil. Transf.

<sup>w</sup> Vide vol. 1, p. 101.

experiments instituted for the purpose. Neither can the human subject return it to the quadruped, more than the quadruped can to his own species. Dr. Vaughan besmeared a lancet with the saliva of a child then dying of the disease, and with it inoculated a dog on the nose. In some remarks with which he concludes his valuable histories, he adds, “two months are now elapsed since the dog was inoculated with the saliva taken from the last patient: he continues now, at this time, free from the disease.” The Doctor promised the public the result of this trial, and as many years have since elapsed without farther intimation, we may reasonably conclude no disease to have followed.

It is a well-established fact, that the distance between the bite and the appearance of Hydrophobia, seldom in quadrupeds exceeds a month; and in the canine especially it seldom exceeds three weeks. Mr. Edwards, who communicated Tweed’s case, during the time the malady prevailed among the quadrupeds in his neighbourhood, inoculated a dog from the saliva of a cow, with the same want of success. Now it is well known, that though many escape the disease among the human

L. race,

race, who are bitten, yet few, if any, of the dog kind wounded by a dog continue uninfected. Hence, if any communicable infectious properties adhered either to the human saliva, or that of the cow, the dog appearing particularly susceptible of the malady, it could not fail to induce the complaint at the usual period.

With respect to the cat, we cannot so positively conclude, because we have not *one* under the influence of the disease for *fifty* of the canine species. Whether this be owing to any peculiarity in these animals, or from their greater shyness and love of retirement in the day, exposing them less to be attacked, is difficult to determine: the latter perhaps is the case. Nor can we with less difficulty explain, why the cat, of a species so different from the dog, can propagate the disease, which I believe all other animals are incapable of doing: yet the fact is certain.

Reasoning analogically from this, and carrying our researches no farther, my opinion would seem to stand on a bad foundation; but analogies, as is well known, are but imperfect lights. The negative arguments above prove more, and must remain unrefuted, till  
over-



overturned by fact. A story to the contrary has indeed lately been propagated, of a cow communicating the disease to a man, who fell a victim to it; but its fallacy has been detected.\*

We may consider this want of communicability among our domestic animals, from one to another, and the same insusceptibility of infection from one of our own species to another, as a peculiar blessing, rendering the effects of this hitherto unconquerable malady comparatively less portentous in its consequences. When a satisfactory persuasion of these facts shall be entertained, no longer will the unhappy hydrophobic be deserted in his agonies, nor the cruel practices just enumerated, be prosecuted.

It will be nugatory then to quote, as an illustration, the instance of the family at Chestertown in Maryland, who drank the milk of an hydrophobic cow: nor of the negroes on a farm in the same place having eaten of the flesh of several hogs dead of the disease, without inconvenience or harm; nor others of a like kind detailed by some authors:† for if these  
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\* Vide vol. 1, p. 9.

† Vide Mem. de la Soc. Roy. de Medicine, ann. 1783.

animals were incapable of spreading infection, when under its influence, their flesh and other secreted fluids must equally remain free, and be as innocently consumed as other wholesome viands.

It would appear, that nature has wisely set bounds to the diseases incident to the different kinds of animated beings; and that the maladies peculiar to one species do not, as a general law, spread into another. If, like the instance afforded by Hydrophobia, they be casually ingrafted into an alien stock, they die, like hybrid animals, without succession. Daily examples of this pass before us. To what class of animals (save man) can the small pox, measles, scarlatina, whooping cough, and other specific diseases be communicated? There are general diseases indeed in all animals bearing strong similitude to one another. With catarrh, and some other general disorders, horses, cows, sheep, and man are equally affected; but these proceed not from specific poisons. No mode of infecting will succeed in producing among the cow kind, the scarlet fever, though dropsies, diseased livers, and suppurated lungs are common to them with man. Nor will any mode to bring the murrain, or  
that

that species of disorder peculiar to horned cattle, occasionally so destructive in the northern parts of Europe, and so communicable among themselves, succeed when attempted in the human race. This being acknowledged, the following fact will not seem extraordinary, which observation confirmed, that on a voyage sheep did not communicate a fever, contracted by them on ship board, to hogs living in common with them in confinement; neither were the crew in any degree incommoded by it.

With respect to other diseases among the human race, besides what are mentioned, let it be added, that from repeated trials made for the purpose by the late Mr. J. Hunter, no disease followed from the inoculation of a dog, bitch, and an ass, with the venereal virus, though so easily communicated and dispersed among mankind by the usual modes of contact.<sup>a</sup>

As to the small pox, direct and unsuccessful experiments have been made on the subject. "In the various attempts which I have made," says Dr. Woodville, "to communicate  
the

<sup>a</sup> Treatise on the Venereal Disease, c. 1. Sect. 6.

the small pox to different animals, as dogs, rabbits, poultry, &c. both by the ordinary way of inoculation, and by injecting variolous matter into the viens, no disease was produced.”<sup>a</sup>

This observation has been carried farther; and it is asserted, that among different tribes of the human race, where variety in colour and mode of living seem to form the chief distinction, there are also peculiar diseases to which one is liable, and the other exempt. Thus it is said of the Indians at Nantucket, that “they were carried off by diseases which never infected the white inhabitants among them.” Dr. Lining tells us, “that the negroes were never afflicted with the yellow fever in South Carolina, although constantly around the sick; and these again have diseases peculiar to themselves, to which the whites are entire strangers.”<sup>b</sup> Surely we must discover here, the wise and benevolent purposes of the Author of Nature towards the different animated beings, deriving from his omnipotence their existence.

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<sup>a</sup> Vide Woodville's History of Inoculation, vol. 1.

<sup>b</sup> Vide Mease on Mad Dog, p, 5, edit. Lond. 1793.



*Convulsive Noise vulgarly called Barking.*

THIS symptom, which has heretofore spread terror, and been considered as an indubitable mark of the disease, as well as a proof of the metamorphosis of the sufferer partly, as it were, into the canine nature, might truly, in the present day, be passed in silence as a superstitious error. But some who may peruse these pages, written both for the common and medical reader, may yet remain uninformed of its true nature, and continue impressed with the idea of this occurrence. To these we shall say, that the noise which appears imitative of barking, and which credulity has varied into many frightful shapes, is a mere convulsive effort to free the throat and fauces from a troublesome, irritating, and accumulated mucus, derived from an increased secretion adhering to them, often thick, ropy, and difficult to

dis-

discharge. The diseased sensibility of these parts, heightened by the touch of any fluid matter, creates the convulsive expiration attended with a noise, which a heated imagination converts into the voice of a dog in the act of barking. This convulsive noise however is far from being strongly marked in every case. Some authors have not hesitated to disavow altogether the semblance of barking. Tulpus expressly says "*neminem hactenus audiverim latrare.*"<sup>c</sup>

Other diseases likewise change the tone of the voice. The œsophagus in Hydrophobia suffers however in a particular manner: besides the secretion mentioned, its muscles are thrown into spasmodic contractions, of which the contiguous larynx, where the organs of modulation and speech are seated, equally partakes, producing a variety in the tone rapidly reiterated by the convulsions.

<sup>c</sup> Vide Obs. Med. lib. 1, cap. xx. p. 42.

*Reflections on the remote Cause, or the Manner  
in which this Disease is produced in the  
Canine Tribe.*

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TWO different opinions are entertained on this subject: by one set of pathologists it is maintained, that the seeds of this disease are referable to climate and diet; to cold and heat: by the other it is considered as the effect of inoculation, or is only the consequence of infection received from an animal directly under its influence. Boerhaave was of the former opinion, as well as others of his school: of the latter opinion may be mentioned men respectable; among whom are the society instituted for the express purpose of collecting information relative to Hydrophobia.<sup>d</sup> The  
origin

<sup>d</sup> Vide Transf. of a Soc. for the Improv. of Med. and Chirurg. Knowledge.

origin of the disease, according to them, is to be traced to infection only, and that to no other source need we look for it.

It is true, that in most of the instances coming under our inspection, not only in the dog and other animals, but in man, it can be evidently traced to this source. The poison is directly received from an infected dog, fox,<sup>e</sup> or cat. In tracing this back we sometimes discover them to have received it similarly, and can prove both the time and manner. In examining still farther how that animal may have received it, we discover some strange dog affected with this complaint, communicating it as he passed through the village; and in carrying this research a degree farther, we may be able to find the same dog the property of some person in a distant county; for a dog may wander to a great distance while under this disease, in the course of three or four days, even after his knowledge of home, and his former connections have deserted him. At length we come to a stand, when we can trace it no farther.

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<sup>e</sup> Vide Mead, vol. 1. Case at Stamford—bite by a fox.



It is now taken for granted, that the same mode of communication may have happened to others, as we have already discovered, though our investigations can no longer reach it. Here we rest satisfied, and presume our conclusions to be well founded, because farther information ceases. The disease appearing at all seasons of the year, hot or cold; in the warmest climates also, as well as in very northern situations, become to the investigator a strong proof of the justness of these conclusions. A farther reason still adduced is, that certain countries have been exempted from it till it was introduced by infected dogs.

It is difficult, it is unsatisfactory to acquiesce in this mode of reasoning; nor ought we to conclude, that because we are incapable of tracing the links of the chain up to their origin, and discovering the first rise of the malady, or how derived, that the infection must have existence, and is only latent in its perfect formed state, in some unknown situation, till accident brings it into action in the canine system; thus inoculating the poison into other animal habits, spreading it through a country for months together, till all who have been

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infected either die of the disease, or are destroyed through dread of its future appearance.

It has been asserted, that some countries remain totally exempt from canine virus. Travelers have made such assertions, the only proofs we have of the fact. It has been also said, that some countries have not experienced it through a lapse of many years, such as half a century and upwards. The frequency of communication with these places, and the periods being so recent, afford an opportunity of inquiry into the authenticity of the facts.

Different men speaking of the same countries, with good opportunities from their residence of knowing, have differed in their assertions even here. Thus, when Hilary informs us that in hot climates Hydrophobia is so common that it may be called endemial, he is contradicted, and even with some warmth, by Mosely,<sup>f</sup> who, from this circumstance, suspects him of never having seen the true disease. So far from being a common occurrence, he positively affirms, that after much inquiry, he found the disease not to have appeared in several of the Islands, previous

<sup>f</sup> Vide Tropical Diseases.

vicious to his residence in 1783, for fifty years. In reconciling these contradictions by men of character, there is difficulty; both had opportunities of information, and capacities for observation.

Mosely however does not stand singular in what he relates; persons residing in Jamaica, and corresponding with their friends in England,<sup>g</sup> so late as the year 1792, not only countenance his opinion, but insinuate, that previous to the hurricane in this Island in 1780, the canine infection had not been known there. No hurricane it seems till this, had been experienced for fifty years. In July 1783, the disease broke out among dogs, and spread its ravages till the following March before it was suppressed. The account states an almost annual occurrence of hurricanes since that period, and had it mentioned the annual and frequent appearance of the maulady in the subsequent time, we might be ] tempted to suspect some connection between hurricanes and Hydrophobia.

Whether we believe the disease to be totally unknown to some countries, or otherwise,  
as

<sup>g</sup> Vide Note to Mease on Hydrophobia, by Editor Lond. edit. 1793, p. 54, also note, p. 56.

as Ulloa asserts to be the case in South America; and Prosper Alpinus, and after him Volney, affirm of Syria and Egypt, one thing we can assert, without fear of contradiction, that the disease *does* disappear among ourselves for years together, and then unsuspectedly re-appears without a possibility of tracing it back beyond the first or second instance. The latter afterwards would seem to contradict himself, by acknowledging a word importing the name of the disease to be truly Arabic, underrived from other languages: this implies the existence of the complaint.

It has arisen in a dog at a time when no infected animal of the kind was known or heard of in the country, and when the family have never missed their dog a single day, nor even many hours together from home. Of the truth of this fact I have sufficient assurance. The butcher's dog at Acle,<sup>h</sup> which communicated the disease to the lad whom he daily followed was infected in a manner not to be traced to any animal whatever; nor had the disease, or a dog under it, been heard of in the country round Yarmouth, or within the bounds of  
the

<sup>h</sup> Vide Appendix.



the animal's, or his master's range, for a long space of time before. Now this being ascertained, and the period of interval between the bite when it is received, and the subsequent disease in the dog being likewise well known, had a rabid animal been in the neighbourhood during this short space, seldom exceeding 21 days, he must have been recognised from his ravages, if not actually seen by some persons. We cannot suppose him to pass through a neighbourhood, a thing so unprecedented, without leaving more than one solitary mark of his footsteps behind.

If but one instance can be well ascertained of the disease arising without communication with an infected animal, no hypothesis, however ingeniously maintained, will be able to convince us, that a similar disease may not arise under the same circumstances; and that it may not have so arisen from the earliest ages in every country where the animal has been propagated. The mode of domestication, climate, (local or universal to a country) manner of feeding, season, and temperature, will suffice to reconcile most of the contrarieties of opinion respecting the exemption of certain countries, totally or periodically, from  
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the infection; and will afford some clue towards explaining why it has raged at one time and not at another in the same places.

If the generation of infection can be proved to take place in our own times, and amongst ourselves, and can be referred to the animal itself, to his ingesta, his egesta, and things connected with his own body, his particular situation in all its varieties and circumstances respecting his confinement, weather, drink, food, &c. an end will be put to the cavilling interpretations given to Homer's expression in the eighth, ninth, and thirteenth books of the Iliad.

The different sentiments entertained of this famous metaphor respecting the disease under consideration are well known. Here the fury of Hector is compared to the ravages of a mad dog. This is the doubtful word. One party adopts the idea of *rabid*, as intended by the poet, and thence arguing for his knowledge of the disease, and consequently for its antiquity. The other party contends, that nothing is meant by the expression farther than rage or savageness; and that he speaks of a dog only fierce and savage, and from his  
strength

strength destructive, inferring from thence the poet's ignorance of the malady.

Pathologists have at all times exercised themselves with great ingenuity, in attempting to trace a complaint to its first origin. Their labours tended to a laudable end; but much has been often written without arriving at the desired information. Discourses on the origin of the venereal disease have occupied volumes, and one nation has imputed the scourge as a stigma to the other; nor has the grave historian thought the research unworthy of his pen, or beneath his decision.<sup>i</sup>

The same observation precisely may be made on the small pox. To what country its first origin is to be ascribed has been the subject of equal controversy. It is indeed true, that certain countries are subject to certain diseases, not known in others except by name. The concurring circumstances necessary for their production have not been found in common to give them birth. This does not argue that such may never happen. Elephantiasis, frequent in the East, and trichomanes,<sup>k</sup> as frequent in Poland, are not endemial to Great

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<sup>i</sup> Vide Robinson's Hist. America.

<sup>k</sup> Plica Polonica.

Britain. Again, diseases may exist in a country at one time, violent and destructive, which in the process of ages become extinct; while on the other hand, new disorders will arise from the different modes of life and customs, whether vices, luxuries, or both, unknown to the same regions in former ages. A very little acquaintance with medical history will inform us of these facts.

Circumstances even in the same country will produce a disease at one season, while at another a concurrence of the same cannot meet to give it existence.

There are diseases capable of being propagated in a double way, i. e. by inoculation from a wound directly given, and by absorption into the system, without a wound, of the poison in a state of vapour, either through the pores of the skin, or by inhalation, or by both. This last has been called the *natural way*, to distinguish it from inoculation. Again, there are other diseases though equally infectious, which infest the body, but which cannot be propagated by inoculation.

The measles, scarlatina, hooping cough, and typhus carcerum are examples of the latter:  
small



small pox, venereal virus, and Hydrophobia are examples of the former.

Although these complaints be extremely dissimilar in their appearance and mode of attack, it must not from thence be hastily concluded, that their origin, or the first principles giving form to the particular infection, are equally dissimilar. A slight variation only in the compound may constitute the difference. When a set of circumstances concur to form the one contagion or the other, and when formed favoured also by temperature of weather, habit of body of the individual on which it is to act, then will this or that malady, at this or that season make its appearance. It may be formed too without always effecting a disease. A certain state of habit may then exist sufficient to counteract its operation.<sup>k</sup>

Taking this view of the subject we see how a disorder may appear, or disappear at particular times, without having recourse to a ready-formed fomes, existing for two, three, or more thousands of centuries, and lying hid, as it were, in some corner, in its ready-formed state,

<sup>k</sup> Vide vol. 1, p. 4C.

state, till occasion, from time to time, calls forth its action to afflict animal health.

The same causes which formed it at first will form it a second time, and that which gave it birth a second time may equally produce it a third, a fourth, a fifth, and times innumerable.

That this is Nature's mode of operating I am firmly persuaded: it is simple, and conformable to her other laws. By adhering to the opinion of a specific compound lying latent in some concealed situation till accident, perhaps after a lapse of years, brings it into action, we shall be led into difficulties from whence we cannot easily be extricated. Where can that compound lie unfurrounded by other matter, by atmospherical air, by heat, perhaps by light, the electrical fluid, nay even the magnetic effluvia, without suffering change? Will it be affirmed, that these have no action on it; that none of the compound has an affinity with some of these surrounding bodies, whereby it will be chemically decomposed, and its elementary principles loosened from that particular junction and form, which constitutes the seeds of a specific disease?

All

All nature appears in constant and continual motion, or in other words, undergoing constant and continual changes, though many of them be not only slow, but imperceptible to us. One body is in the act of being composed at the expence of the composition of another. This is the fact, let the name imposed be what it may. It is evaporation, it is fermentation, it is putrefaction, it is any denomination which you choose to affix: it is change of corpuscles, it is change of place and figure in matter giving it new properties.

If the small pox, the scarlatina, the typhus careerum, or in a word, any contagious disease arise in a particular town or village, according to my idea the seeds of the disease, the infection, has at this very season been produced in that individual place, by an accidental concurrence of favouring circumstances. It spreads through a neighbourhood favoured by other concomitant circumstances, the weather, the individual it has to act on, &c. It spreads indeed by contact, which keeps it alive for a longer period than would otherwise take place, but at length it disappears; the circumstances giving it birth no longer exist; objects to act on no longer present themselves, or, their systems

tems are under such a state as to resist its action, possessing now an *insusceptibility*<sup>l</sup> of being moved by the infection for a time.

Can we, in any equally satisfactory manner, explain the appearance of a specific disease, whether small pox, measles, hooping cough, scarlatina, or others arising in a family insulated in the country, unexposed to strangers, unfrequenting company, nor having connection nor conversation with other parts of the country, nor even with their next neighbours? Yet this fact may be often observed.<sup>m</sup>

The small pox will make its appearance in this manner, and has made its appearance in this manner, when the strictest scrutiny could not detect an instance of the complaint in a wide extended district around, and when no individual had approached in contact with the disease, nor in contact with those near it for a long period.

Admit the variolous fomes to remain undecomposed on the point of a lancet, corked in a phial, or wrapped in cotton for a twelve-month, nay for two, and even then it is not sufficient to support a contrary doctrine. The utmost limits  
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<sup>l</sup> Vide vol. I, p. 49.

<sup>m</sup> Ibid, p. 47.



to which it can extend capable of propagating the disease, may not yet have been exactly determined ; but limits it has, when it no longer can be called variolous matter. So far the fact is ascertained, that inoculators have found old variolous matter often to fail ; a proof of its having undergone some decomposition.

The very same arguments will apply to the other specific infections ; they will apply likewise to the class of infectious fevers ; to the plague itself. They arise with virulence ; they continue for a time with severity, spreading rapidly ; at length they begin to decline, become milder and less frequent, and then disappear. At some distant time, it may be a year, it may be two, it may be ten, it may be half a century, the infection, by a new and similar concurrence of causes, is again formed, and the disease is again rekindled.

Applying this to the poison of Hydrophobia, we need not range to foreign climates, nor have recourse to distant ages for its origin : we may discover it in our own country ; we may find it in some of her cities ; we may detect it in the next village, or perhaps in a favourite dog in our own family.

In

In tracing this part of our inquiry more minutely, the mind will be naturally led to the articles of nutriment, their mode of digestion and solution, with the whole process of chylickation and conversion into blood and other parts to form the animal solids and fluids. We shall be led to inquire into the difference of nutriment, its kinds, the condition it is in when taken into the stomach, &c. with the influence of atmospherical air, and temperature of the weather. This will bring us to an interesting discussion respecting the share which putrid aliment has in producing the seeds of various diseases.

It is notorious in this country, and perhaps in several others, that the dog is not only fed on carrion, but of carrion in a state of putrefaction, nauseous to behold, and offensive to approach. If we add to this his confinement, which is frequent, either in kennels, or in small wooden cages, little more than sufficient to lie in, for weeks, and sometimes months together, with a state of the primæ viæ that must follow, we may be led to the source of great deviations from health.

The dissolution of animal and vegetable matter, both externally and internally, in living

ing human bodies, is now known to produce the most pestilential diseases experienced on the globe. These may be varied by the difference in the compounds during the process in many ways, far from being as yet all discovered, forming modifications and disease, various and multiplied as the matter from whence they proceed.

In these important changes constantly going on under certain situations, there is room to suppose, nor is the supposition improbable, that a compound may take place in the canine habit, either from the air around, which he constantly inhales, tainted with poisonous vapour, or from the putrid matter within his bowels, or in both combined. In the curious and useful investigations with respect to the origin of nitric acid (septic<sup>n</sup> acid) it has been discovered, that it is not only of animal origin, contrary to what has hitherto been believed,<sup>o</sup> but

<sup>n</sup> Vide Beddoes's Considerations, part 5. App. paper by Professor Mitchill.

<sup>o</sup> During the present war the French chemists turned this discovery to an useful purpose in their military operations: for when their nitre failed, they composed, by the assistance of putrefying animal substances, sufficient to supply the deficiency. The origin of this acid has hitherto

but that it is formed in no other way than from the corruption of animal and vegetable substances, heaped together in the open air, under certain degrees of heat<sup>p</sup> and moisture, and likewise heaped in the intestinal canal, even in living bodies.

The history of nitre gives much insight into the manner in which nature composes this acid. It is now well ascertained to be azote (septon) and oxygene. When the principles of animal and vegetable matter are examined, they are found to contain these two substances. In the act of putrefaction they are freed from their former combinations, unite together again

the~~re~~to been referred to the mineral kingdom; but both Boerhaave and Macquer were acquainted with the fact, that its origin was of the animal. Fourcroy afterwards confirmed the same.

<sup>p</sup> A degree of heat from 75 to 80, or 82 of Farenheits thermometer will be sufficient.

<sup>q</sup> To the term azote several ingenious chemists object. Nitrogene appears more appropriated; for the derivation of the word azote referring solely to a substance unable to support life, does not properly distinguish it. Neither Hydrogene nor carbone can support life. *Septon*, is unobjectionable as far as relates to putrefaction. It would be better perhaps in forming the name, to preserve the radical. If we say *oxygene*, *hydrogene*, why not *nitrogene*?



again by affinity in various proportions, according to circumstances, forming new bodies of various properties, according to the quantity of the one with the other:

If oxygene be united to its base in its greatest proportion, it is nitric acid; it is a fluid well known in commerce: united with a smaller portion it is nitrous acid; with a smaller still it is nitrous gas; and with a farther diminution we have that fluid, named by its discoverer, Dr. Priestley, dephlogisticated nitrous air, or the gaseous oxyd of azote (septon) so singular in its property of supporting flame; yet at the same time so deleterious as to destroy life the moment it is inspired.

It is now well known also, that unless the blood receives a certain portion of oxygene, which is supplied by the atmosphere through the medium of the lungs, neither will sufficient heat be given to the body, nor will the other parts of the system be supplied with this vital fluid, in due quantity, to preserve the balance of health.<sup>r</sup> If, together with atmospheric air, we breath this noxious vapour, this speedily destructive compound, we may dif-

<sup>r</sup> Vide page 98.

discover the origin of certain diseases; and, according to the quantity imbibed in a given time, or acting on the habit, will be both their dangerous quality and difference in type.<sup>s</sup>

This poisonous gas never floats far from its source when it happens to be produced from matter corrupting in the open air, because it is heavier than the common air,<sup>t</sup> unless driven by a current; and here we find the reason  
why

<sup>s</sup> It is very difficult to decompose the gaseous oxyd. Hydrogene is the only substance discovered as capable. From Dr. Priestley we learn its miscibility with water. By this means he was able to separate it from nitrous gas when the two were mixed together. The latter would not combine with water, floating unabsobered above it.

<sup>t</sup> A cubic foot of azotic gas weighs one ounce, thirty grains and a half: a cubic foot of oxygenous gas one ounce, one dram, and fifty-one grains: a cubic foot of nitrous gas one ounce, two drams, and thirty-nine grains. These were taken when the mercury in Fahrenheit's thermometer stood at 54. 5, and the barometer at 29. 84.

If a combination of the two first took place in the proportion of thirty-seven of oxygenous to sixty-three of the azotic, which forms the gaseous oxyd, the compound would be somewhat heavier than atmospherical air, the composition of which is about twenty-five of the oxygene to about seventy-five of azote. Hence the gaseous oxyd will occupy the lowest part of the atmosphere. It will float next the floor of a room, or close by the ground, in a low situation, where animal and vegetable matters are undergoing putrefaction.

some of our most infectious diseases begin in one part of a street or alley, or sometimes from a single family, among the poor with bad accommodations, or dwelling in filth, and from these places spread their ravages, by contact, far and wide.

If, while this poison be breathed, it is at the same time generated within the body, still more rapidly deoxygenating the blood, a proper portion of carbone not being carried off, maladies of a still more speedy fatality must ensue. The body is attacked at once, both from within and from without; nay even from the surface of the skin partly imbibing it: nor is it possible, under these united powers invading on all sides, for any time to stand the conflict.

Viewing the subject of general infection in this light, its importance is truly great; but it points to its own removal, happily leaving the mind more at ease by its being able to discover an easy method of escaping so dreadful a scourge. This, in one word, as far as it respects man, may be referred to *cleanliness*, and the method of living which we pursue in regard to our diet, and other things appertaining to it, all of which may be comprehended by the  
term

term temperance: and as far as relates to our domestic animals, bred for convenience, especially the dog, and perhaps the cat, as being flesh eaters, to the manner in which we supply them with nutriment, to the lodgements provided for them, the exercise given them, with things of this nature conducing in general to animal health.

I conjoin the cat here, but I do with doubt, because as far as my information reaches she rejects putrid flesh, nightly prowling for her prey, when at liberty, which she devours fresh; and these being generally vermin, or small birds, which she finishes at a meal, never, that I have yet discovered, returning a second time to feed on the remains of her last repast. Not so the dog; he loves carrion, or flesh in a state of putridity; is conducted to it by the quickness of his smell, even to a great distance.

Another reason I would offer for exempting the cat is, her well-known propensity to cleanliness. She cannot bear even the smallest speck of filth for any time upon her body. By the assistance of her paw, wetted with her saliva, she brushes and smooths her silken fur. She likewise, for the most part, rejects vegetable



table diet. Milk she is fond of, but it is an animal production, and partly at least animalised. Her food therefore being more purely animal, eaten while recent, is the less apt, from the want of the acidifying principle supplied by vegetables, to give birth to the poisonous gas; for the azote, which may be evolved in the intestines is a harmless vapour passing off by natural outlets, except as far as it meets with oxygene, to render it active and poisonous, which will be proportioned to the degree of its under-oxydation.

To this I would add, that there is but one example, at least known to me from books, of any of the cat genus, a numerous tribe, where it is affirmed, that they were discovered rabid in their wild state by the disease being spontaneously generated.<sup>u</sup> This is of the leopard, and the assertion appears to come to us under very suspicious circumstances. It is Cælius Aurelianus who has communicated the observation; and it is more than probable, when we reflect how seldom persons return with life, after  
 venturing

<sup>u</sup> By spontaneous I mean here without inoculation. It is totally distinct from what is to be understood by spontaneous Hydrophobia, as delivered in vol. 1, p. 249.

venturing so near these animals as to afford an opportunity of observation, that this author took it up on no better grounds than the idle tale of vulgar report. The cat then, I would almost venture to say, never experiences the disease produced spontaneously, but derives it, like many other animals, from the virus inserted by a wound.

The natural habits of the canine tribe do not lead them to the removal of filth from their bodies; and we have seen how great their propensity is to devour corrupted flesh. They are at the same time vegetable eaters, at least in their domestic state, a thing well known to every housekeeper and dog feeder. They even eat vegetables occasionally in their raw state; I speak of grass; but this it may be said nature leads them to, as a preventive, not a provoker of disease: for they are observed, while labouring under cholic, and other bowel complaints, to betake themselves greedily to the eating of grass, and generally in such quantities as to prove purgative, wiping thereby the fordes from their bowels along with the poisonous feculencies contained in them.

Let me observe, that costiveness itself, especially if accompanied with the free use of animal

mal food, whether here or in the human race, as it favours the production of the gaseous oxyd, is detrimental and highly dangerous. Animal aliment is conducive to this habit of body. Dogs are seldom observed to be otherwise, unless it be obviated by attention in their keepers to their diet, or by the operation of laxative medicines. If they are suffered to prowl at large, consuming as they meet it the corrupting fordes from every dunghill, the frequent lot of the poor man's cur, costiveness, for the most part, is the consequence.

If they are chained in the cage, perhaps for months together without exercise or motion from the door of their contracted lodge, farther than a few yards, and at the same time well fed with animal offal, the same must follow: if in the more spacious kennel the pack be confined to horse flesh and other carrion, without a proper portion of laxative food, the same will take place, and perhaps in a higher degree from its greater putrescency. This however may not often be the case, from the greater attention gentlemen now pay to the diet of their packs by the addition of plenty of milk and barley-meal pottage; but I speak of its possibility.

If to this be added the inconvenience arising from an improperly constructed kennel, too small for the lodgement of from fifty to sixty dogs; too low also in its roof to contain a portion of air to sustain healthy respiration for any time, and along with this so incommodiously and imperfectly ventilated, that a quantity of the vapour which they expire, loaded with noxious particles, is always kept floating around them, (the removal of their fœces being likewise neglected) we shall immediately perceive an additional source whence deviations from health may draw their origin, which, though slowly and imperceptibly acting, are not less dangerous, and may predispose the body to different diseases, according to constitution, in which the dog differs equally with man.

If the other concurring causes just enumerated exist likewise, we see an united force which may show its effects on one animal different from what it does on another, either from a difference in the degree of the poison generated, or in a weaker organ suffering more. We shall now have a variety in disease appearing in one animal; or we may even have a disease from which the rest at the time seem totally exempt.

It



It has been denied by some, that neither high feeding, nor carrion, because it is naturally sought by the animal, influences the dog's health; but reasoning as we have done, and examining the materials he devours, we find the seeds of disease in plenty. These principles are pent in by costiveness, the natural consequences of such diet. They collect and augment in quantity, become mixed and compounded into a variety of new forms; and accelerated by the heat in which they are placed, and the remora which they meet, a gaseous fluid, highly poisonous and deleterious to the animal itself, must be the product. This mode of reasoning indeed is not allowed to rest merely on hypothesis; but fact confirms the real existence of what is here alledged.

The very diet of which we are speaking is proved to have given birth to the disease under our review; I mean rabid infection. An example is given by Dr. Mease<sup>w</sup> in the following words: "We had a remarkable proof of the influence of carrion eaten by dogs, in setting them mad some years since, in this city.<sup>x</sup>

At

<sup>w</sup> Vide Essay on Bite of Mad Dog, p. 85, edit. Lond. 1793.

<sup>x</sup> Philadelphia.

At the conclusion of the late war, and before that period, all the horses and other animals that died in the city were carried out to the commons, and suffered to putrify there ; and it is *well known*, that at this period madness was a most common disease among dogs, who used constantly to devour this carrion : but of late it more rarely occurs among them, since the former practise is not any longer suffered." The short period intervening between the time this took place and the publication of the account, together with Dr. Mease's proximity to the source of information, must remove all suspicion of an hear-say transaction.

Here are two causes concurring, the putridity of the flesh, and the quantity devoured. While plenty of food so much to this animal's taste existed, it will be readily believed, that he would neither be sparing in his repast, nor remiss in the frequency of his returns to the same table, having no impediment to obstruct him. The heat of the weather is not mentioned, neither is the season of the year. But this omission is not material ; for though weather and climate might concur in evolving and combining a poisonous gas, from the known circumstances of putrefactive fermentation,

tion, yet the animal had, independently within himself heat, and every circumstance sufficient for the production of the deleterious matter, as we have already seen. Nay, from the entrails of these animals, (horses) vegetable eaters, affording in plenty the principles composing it, he might receive it ready formed and concentrated in quantity, not only into the stomach in the act of deglutition, involved and mixed with his saliva, but into the lungs through the nostrils, in the act of inspiration, communicating it by this medium immediately to the system. This I apprehend is not to be controverted.

What the precise matter giving rise to rabies in the dog may be is not easily to be determined; but that it is some condition of azotic oxydation is, I think, not only rendered probable, but almost certain. Even various degrees of this process may excite the complaint in different animals, as it will exert itself according to the difference of strength<sup>v</sup> in the fibre with different effect.

If this reasoning be applicable to the dog, it will be even more strongly applicable to the  
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<sup>v</sup> By this term I mean its particular formation.

the fox and the wolf, when their mode of existence is taken into consideration. Their lurking in dens ill ventilated, and, for the most part, dirty, where this noxious vapour must be generated, their untimely meals, being now hungered, now gorged with their casual prey, which in like manner must favour its generation within them, may be a cause altogether adequate to the effects perceived. Hence so frequent madness discoverable among wolves in the countries where they abound, and which is so severely experienced by their ravages.

From the nitrous oxyd to the gaseous there are several shades,<sup>z</sup> and there may still be more, which the researches of the chemist have yet to discover. It is probable that we ought to look here for the different effects dissection points out on different organs of the animal dying from the influence of this malady. It may account in some measure for Morgagni's declaration; and indeed from what every dissection proves, that the disease is so various and dissimilar to itself, that no two dissections are alike. It may afford some explanation to the puzzling phænomena of ruptured parts; it  
may

<sup>z</sup> Vide Beddoes's Considerations, part 5, paper by Professor Mitchill.



may explain the small, numerous, and irregular points and abrasions, even sometimes ulcers, imposthumes, and erysipelatous gangrene spreading through the stomach and part of the œsophagus, with mortified spots, now and then found on the diaphragm and liver, arising from Hydrophobia. Some deviation in the proportions of the compound, some fortuitous circumstances respecting the individual acted on, may form the variation, and serve to elucidate the nature of these appearances.

It is admitted, that a certain condition of the air, the season and climate favouring this state, may be accidental and concurring causes, giving existence to this infection, as well as to infection in general. How far however a state of the atmosphere can of itself produce rabies may be doubtful.

Mosely has asserted without hesitation, that the circumambient atmosphere can, without other auxiliaries, produce the complaint; and describes such an occurrence having taken place in the West Indies, in 1783.<sup>a</sup> At this  
time

<sup>a</sup> He doubts if the disease was *ever seen* at Jamaica, at least before this year. Dr. James, on the authority of Col. Martin, affirms it never to have been known in the island of Antigua.

time it was general; and several people perished by it in Jamaica, besides horses, hogs, goats, and other domestic animals. He particularly specifies dogs being seized with it who had no communication with each other.

According to the idea I have given of infection this I can readily believe may have happened; and the fact, thus authenticated, establishes the foregoing opinion, that it is not necessary to have recourse to antiquity, to foreign climates, in search of its origin; or endeavour, by suppositions or quotations from the works of credulous travellers, to prove its importation into these, or into any particular country. On this ground I admit its spontaneous generation, without the intervention of inoculation by a rabid dog.

Mosely stretches his idea somewhat farther, giving a quality to the air, not locally considered, but in a general and extended sense, sufficient to give it birth. He illustrates it with this fact: "Some dogs that were brought from Europe and North America, and that were *not on shore*, went mad on their arrival in the harbours in the islands."<sup>b</sup> It is difficult  
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<sup>b</sup> Vide Trop. Diseases, p. 31.

with me to acquiesce altogether in the notion of the atmosphere of a whole island, or even of a considerable district being so loaded with a particular poison, so far vitiating it as to produce rabies in dogs, whether belonging to the island, or those newly imported. I am inclined to think, that a state of the air so tainted must have had evident effects of some kind or other on animal health in general, particularly the biped and quadruped.

The quadrupeds mentioned to have suffered received it by canine inoculation; they are therefore out of the question; the atmosphere is not considered as co-operating in them. No epidemic malady is at this time spoken of in the country, either among the human or brute species. Yet no wide-spreading epidemic, I believe, is recorded, in which the atmosphere is presumed to be pregnant with the matter producing it, where we do not find considerable deviations from health among the domestic quadrupeds.

They may not indeed have the particular kind of disease then raging, occasioned doubtless by their particular organization; but they have disease, and sometimes attended with speedy fatality. The different histories of the  
plague

plague evince this. Cats, dogs, horses, mules, and animals in general domesticating in infected houses, or remaining in the streets, whether such as are employed in labour or otherwise, breathing an air replete with the poison, were always observed to be less or more under a state of illness.

In the wide-spreading influenza in spring 1782, I can assert, from my own observations, horses, dogs, and sheep to have been manifestly affected.<sup>c</sup> Preceding the appearance of the yellow fever in Philadelphia, in 1793, various diseases, which seemed to have some connections with the state of the atmosphere, were common in the city.<sup>d</sup> I would not go the length of denying, that the air might not have some affinity to the propagation of canine madness in Jamaica at that time; nor would I deny, that a combination of the principles of gaseous oxyd, which I presume to be nearly connected with this malady, might not take place by ærial commixion, independent of fermentation in animal and vegetable matter within the bowels of living or dead animals, or of collec-

<sup>c</sup> Vide Reg. Surg. vol. 2, edit. 2. Account of Influenza.

<sup>d</sup> Vide Rush on Yellow Fever, 1793.



collections of fermenting matter in houses, streets, or other places favourable to the process. The thing is possible.

In the great aërial magazine are both azote and oxygene. The atmosphere is composed of it; and it is possible sometimes to be in a disengaged state; amidst the constant motion of particles arising from the earth, and in the floating vapours, new combinations of those principles may take place, but it would appear that they must be in a diluted form.\*

I will admit a long continuance of its action even thus diluted and unconcentrated, to avail in disposing the body to some species of disease;

\* Certain combinations in the atmosphere instantaneously fatal to animal life, and in masses of great extent, do really happen in nature. The East Indian land-wind may be brought as an example. Of its precise nature and component parts no history, as far as I know, has yet been afforded. It cannot be approached but at the hazard of life.

In July 1796, says an account (Vide Star for February 1797) from the East Indies, this pestiferous wind destroyed fifteen unfortunate natives travelling at the time. The ominous blast overtook them; experience had taught them its baneful effects. They ran under the shade of some trees for shelter till the gulf should blow over, in hopes to avoid it, but in vain; they were all found dead, parched, and dried by this dreadful wind. To what is it owing? What chemical admixture forms this product, and from what laboratory does it proceed?

disease ; but that dogs transported either from North America or from Europe, uninfected when they left those places, should be all at once seized on their entrance into the West Indies, even during the prevalence of the disease in the country, and especially in the neighbourhood of these parts, without communication with the land, is not easy to be explained.

If Dr. Mosely knew this to be a fact, which ought to be admitted as indisputable, I should rather be inclined to look for the infection from another source, at least not less improbable, either that it was generated within the brute, from the species of aliment on which he fed during the voyage, or before it ; the bad air that he might have breathed, confined below in the ship, with the concomitant circumstances of scanty, and even impure water ; or from infection actually received before the voyage commenced.

I would not rest it however on this last, unless it could be shown that the voyage was short of a month. I would not rest it here on another consideration, for though one vessel might bring from home an infected dog, it would be a strange and uncommon concurrence of circumstances, to find different ships from different coun-

countries, bringing with them also inoculated animals, and all meeting at one anchorage in a harbour at Jamaica, where, on breathing the air off the land, tainted with an infection which had produced it on shore, they should all take it nearly together. This is an improbability instantly to be abandoned.

Long and loud accusations have been brought against water aiding some process generating the infection, from the earliest writers to the latest who have reasoned on the nature of canine madness. It is impossible to suppose so many writers, unconnected with each other, to make this observation without having some foundation to rest on. Circumstances leading to this conclusion must have appeared to them before it could be adopted. We cannot therefore consider it altogether in the light of a vague report. I shall admit it to have a connection with the *spontaneous*, or underived and uninoculated disease.

The notion indeed of this connection is so prevalent in some places, as to engage the attention of magistracy. The author just quoted, and who, I think, travelled into Italy, and made some stay at Venice, relates, that in this city there is a law obliging some descriptions of  
work-

workmen (handycraft) to preserve near the doors of their workshops small troughs or basins of water, that dogs running past may satiate their thirst when urgent; and thus the canine disease, of which they consider the want of water as one of the remote causes, be prevented. In Venice are no streams in the streets, nor reservoirs of water from which the dogs running about can be supplied when thirsty.

It is a fact sufficiently notorious, that without frequent supplies of this fluid, the due balance of health will be lost. Our own feelings daily tell us this. The distress occasioned by the want of water is still more forcibly exemplified by the narrations of mariners shipwrecked at great distance from land.<sup>f</sup> Applying this to the dog accidentally placed out of the reach of water for several weeks, united to a hot season and dry atmosphere, with full animal food, perhaps putrid carrion, an alteration can easily be conceived to take place in his fluids, favourable with other causes, hitherto mentioned, for the production of disease.

<sup>f</sup> Vide Bligh's Narrative, and others.



case.<sup>g</sup> This may be fever, it may be rabies, according to some alteration or change in the degree of the poison generated, in the oxydation of the azote, or from the subtraction of vital fluid from the blood, or the detention of too large a portion of carbone.

I believe it is now generally admitted, that water is decomposed in the stomach and intestinal canal, uniting with the substances it meets there; and according to the laws of affinity, forming new compounds. In this way water may have effect in preventing the production of the deleterious vapour. Its oxygene will supply the deficiency of this principle in the habit: its hydrogen will unite with the superabundant carbone and febacic acid in the formation of oil, or fat, another necessary compound, whereby less opportunities will be given to the generation of poisons. But should we suppose it only in the light of a simple diluting fluid, without suffering decomposition, even then it will have its use: for it has been  
found

<sup>g</sup> Water is always imbibed from the atmosphere thro' the cuticular pores, whence the absorbents carry it to the blood; but the cuticle of dogs, as we shall hereafter see, is not favourable towards this process, from the minuteness and paucity of its pores.

found by experiment,<sup>h</sup> that though the gaseous oxyd could not be decomposed either by sulphur or caustic fixed alkali, yet it readily mixed with water.<sup>i</sup> Now, in this state the oxyd may be carried off by the different excretions, leaving the animal unhurt. In this way some explanation may be attempted of the usefulness of water in the prevention of canine rabies.

If want of water and the presence of heat have been equally considered as favourable for engendering this malady, great degrees of cold have been no less a presumed cause in giving it existence. It may not be easy to explain, why two conditions so opposite to each other shall be followed with precisely the same effect; yet that rabies has arisen under great degrees of cold is an observation as ancient, I believe, as the other remote causes just enumerated.

Ætius testifies to this truth.<sup>k</sup> It had appeared, he affirms, not only where the greatest heat prevails, but likewise where the *rigours* of

<sup>h</sup> Vide Beddoes's *Considerations*, part 5. App. paper by Professor Mitchill.

<sup>i</sup> Vide p. 172, note.

<sup>k</sup> Lib. vi. cap. 24.

*of winter* were felt in the extreme. Instances of the same have occurred in our own, and doubtless in all times. Every observer in the course of his life has had opportunities of verifying the fact from ocular testimony. I have witnessed it in more than one season. Mease has seen several instances of it in the city of Philadelphia. The great winter colds occasionally taking place there, are well known to be attended with rigour, and duration unexperienced, at least seldom known in England. In some of the severest seasons felt in that country, dogs went mad. "This was particularly the case in that of the years 1779-80, when more of those animals perished by the disease than for a long time before."<sup>1</sup> The same has been observed in Maryland, where in these rigorous winters even a greater number perished than at Philadelphia. The cases annexed to this treatise will prove how often it occurs in the winter season.

On the 25th of Dec. 1796, the coldest perhaps ever felt in this country, a child near Bath was said to have died hydrophobic, bitten about a month before. I can enumerate within

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<sup>1</sup> Vide Mease on Bite of Mad Dog.

my remembrance three instances of its prevalence in winter. What connection has cold with this disease? What share has it in its production?

That cold is instrumental in producing other diseases we well know; but if existing only to a certain degree, it is likewise powerful in meliorating some, and in destroying altogether the seeds of others. It is an opinion almost universally entertained by every description of men, physicians not excepted, that frosty weather meliorates health. Nor is it an uncommon thing on the setting in of frost, especially after the autumn, to hear people congratulate each other on it.

Experience, to a certain degree, must have sanctioned the opinion, otherwise an error that every man's feelings told him existed would have been abandoned. The rosy look, the florid complexion, the brilliant eye, the brightened countenance, and firmer walk in every passenger you meet, in every friend with whom you converse, and every company wherein you mingle, stamp with validity the common opinion. Ask the valetudinarian of his health, he answers briskly, the frosty weather has cured him. Make the same enquiry of a nervous lady,



lady, respecting those aches and pains on which her mind is so intent, that they make part almost of every conversation with which she entertains her visitors, she will answer much in the same manner. Her sleep is more refreshing, tinnitus aurium gone, her head-ach is fled, her appetite, lately so delicate and fastidious, is already mended, and she not only bears motion commodiously, but is even refreshed after the exercise of walking, which but a few mornings before she was unable to undertake, or if attempted, her enfeebled muscles were unequal to the task.

There is no medical man whom this observation can have escaped. Among my friends of both sexes, whom I meet in the common intercourse of company are, as must happen to every man, valetudinarians of various degrees in the derangement of their health.

In the great vicissitudes of weather, from the first day of Dec. 1796 to the succeeding April, opportunities were afforded me of inquiring more minutely into the connection between the weather and this state of body. I turned my attention more especially to this subject from perusing a paper by Dr. Heberden, on the comparison between frosty and mild winters

ters in respect to health and fatality.<sup>m</sup> In the first days of frost the melioration of health in my friends of this description perfectly coincided with common opinion.

In one lady, aged 36, occasionally my patient for more than five years, with complaints generally comprehended under the term *nervous*, and with these a tendency to debility in the pulmonary system, and irritability in the mucous membrane of the trachea, the amendment was remarkable.

On the 24th of December, about eight in the evening, when the mercury in the thermometer had suddenly sunk to 15° she expressed herself to have felt more light and cheerful throughout this day than for some weeks before. Since morning she had been much in the open air at different times; and on giving this narration added, her tickling cough, a troublesome companion for some time past, had this day ceased to give her uneasiness.

Another lady, aged about 30, subject to *nervous* head-achs, declared herself to be totally free from them, a happiness she had not experienced

<sup>m</sup> Vide Phil. Transf. part 2, for 1796.

rienced for a considerable time. This inquiry was farther confirmed afterwards during the succession of thaws and frosts happening two or three times before the frost totally disappeared, by similar answers from other valetudinarians of both sexes. A thaw constantly renewed their complaints, brought back their coughs, their dyspneas, their inquietudes and loss of spirits, while the returning frost as constantly removed them. But this had its limits. It was curious, and not unimportant to mark them.

When the frost had continued uninterrupted for some time the condition in all was changed; in some very materially. The long-continued action of dry and cold air began to show effects unfavourable to the system. The dose, as it were, became too large; absolute heat was conveyed to the habit in too great abundance; the blood, as it would seem, was hyper-oxygenated, and the heart, with the arterial system, was excited to too great exertions, and a train of inflammatory complaints succeeded, to several dangerous, and to many, especially the aged and infirm, fatal.

These were manifested in the forms of rheumatism, gout, pneumonic and catarrhal inflammation.

inflammations, scarlatina, small pox among children, asthmas recurring with renewed violence and long paroxysms, apoplexies and palsies among the elderly; and these, with other diseases, varied according to the constitution of the individual.

An elderly lady nearly lost the use of speech for some weeks, by exposing herself for about an hour in the open air in her garden.

An unmarried lady, about 40, a valetudinarian, and what is generally termed of leucophlegmatic temperament, after the continuance of the frost for some time, suffered an hemiplegia from which she did not, for many months, recover strength to walk, nor perhaps will, for the rest of her life, experience the free use of her limbs.

An ulcer of the leg to which a lady of 75 had been subject for several years, but which had been perfectly cicatrised for some months, broke out anew, as happens to patients under scorbutus.

Ophthalmias were extremely troublesome and extremely severe, especially among coachmen driving the public coaches, and exposed thro' the night to the cold; among waggoners and carters daily engaged in the streets, or about the



the quays. Scrophulous swellings were not less frequent.

Chapping of the face and hands, and blisters about the mouth and nose, were the lot of some. A person informed me, after being engaged in the open air some hours on one of the severest days, that his lips swelled, his nostrils were excoriated, and in drawing in the frozen air, a pain in the forehead (in the course of the frontal sinuses) struck him instantaneously, and was renewed in each inspiration, as if a number of pins were at once pricking the parts. A continued day of this severity, had he been forced to have remained in the open air, he believed would, to him, have proved fatal. At this time his fauces became hot, dry, and parched, and his voice hoarse and thickened.

A surgeon here informed me of his having some febrile cases then under his care, which were undoubtedly of the typhus kind, and even put on marks of putridity. The same species of fever broke out in another family, where I was a frequent visitor; but it was some time previous to the commencement of the frost. It appeared first in a female servant; she knew not how she caught it. It  
seemed

seemed indeed not to have been caught by contagion, but produced in consequence of a state of long previous debility. She had no communication whatever with sick persons, nor with others out of the family.<sup>n</sup> A train of debilitating symptoms succeeded in the form of loss of appetite, pain in the stomach, nausea in the morning, weariness and weakness all over the body. This was early in September; she applied for advice at this time, and her complaints being considered as dyspeptic, the usual remedies were ordered, bark, bitters, steel, &c. Six weeks under these medicines produced no amendment; on the contrary she was evidently worse, though all this time she continued her daily work. Unable longer to hold out, she took to her bed with all the symptoms characterizing typhus. At the end of some weeks, on her convalescence, the footman was attacked, and his life, for some time, was in imminent danger. The weather was now cold. The disease was evidently contagious, as he must have received it from her.

<sup>n</sup> The daily work in which she was engaged was beyond her strength; but a desire to retain her place urged her to a continuance of her exertions.

her. The nurse likewise fell ill after the commencement of the severe frost.

Dr. J. Hunter likewise confirms the appearance of putrid and infectious diseases occurring in the midst of winter, and in the coldest seasons.<sup>o</sup> Nay, he thinks them more apt to arise in the cold than in the hot, because in the latter people live, as it were, in the open air (he is speaking of tropical regions) and experience the benefit of free perfusion: in the former the poor, especially those living in small apartments, and in other respects ill accommodated, shut close their doors, and every crevice where air can enter, in order more effectually to exclude the cold. They live thus in a sort of vapour bath, or like an animal under a bell, from which if the air is continued to be excluded death, in a short time, must follow: but if a small portion be admitted the creature may continue to live, though not long in health.

In these cases, it would seem, a poison is generated something in the manner already explained, part of which may be attributed to internal causes at the same time operating with  
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<sup>o</sup> Vide Med. Transf. vol. 3, p. 345, et. sequent.

the external. The above author attributes the infection principally to the exclusion of the free air.

On the whole, from these proofs of the generation of infectious diseases in cold seasons, and from the comparison of the deaths within the bills of mortality in London, in Jan. 1795, (a month of severe weather, as were the two succeeding months) with January 1796, as remarkable for mildness of temperature, as the preceding for rigour, the conclusion drawn by Dr. Heberden of the healthiness of mild seasons over the cold and rigorous, will be found just, though the variation will be greater proportionally in the scale of fatality in great cities than in the country. This will arise from obvious causes, one of which doubtless will be the change of temperature daily alternating during the frosty weather, occasioned by the heat from the multiplicity of fires, united to the sun-beams during the day, producing a thaw, and the absence of the sun, and the extinction of the fires during part of the night, causing congelation.

If we apply to the dog what we see happen, that a poison may be produced, and is produced in the coldest weather, of a putrid tendency,



dency, highly fatal to the human species, a similar poison, under circumstances to which the animal may be subjected in rigorous weather, may be in them also generated, and is, I think, occasionally generated, capable of producing rabies.

I am now in possession of a number of facts collected for some time past, respecting the production of infectious fevers, generated by a concurrence of internal causes, without any communication with persons under similar diseases. These happened both in hot and cold seasons. A train of symptoms always preceded, marking no specific complaint, but which might be denominated general debility; and from their long standing, sometimes for months, might be termed chronic. No organic lesion whatever, on the minutest examination, could be discovered. A quickened pulse, with restlessness and unrefreshing nights, indicating great irritation over the system, wasted the habit, and confirmed the weakness, till at length a true infectious fever succeeded, displaying in its progress the genuine marks of typhus carcerum.

Debility is the consequence of long exposure to great cold. This is within common obser-

observation. It is seen in a scale from slight numbness gradually ascending up to the frost-bitten foot, and mortified limb. Dogs suffer its effects proportionally to their nature with other animals. It is not necessary here to trace the links of the chain in this operation. To prove its existence is all we want. Under certain degrees of cold the functions of the animal are disturbed. The diet may concur in deranging the system; the fluids cannot then continue in their healthy proportions with respect to their component parts; and there is the possibility, in this way, of a process internally going on favourable to the production of the gaseous oxyd, which has been presumed, under certain circumstances, and applied to certain parts, to give rise to Hydrophobia.

We have not, I presume, been minute enough, or sufficiently careful in observing the manner in which dogs are often lodged and fed (if lodged at all) amongst many of the poor in rigorous seasons. Their masters often cannot feed themselves and families, and their dogs must fare in proportion. If we had examined into these circumstances the fact would not have been denied as impossible, that  
spon-

spontaneous rabies could not arise from natural causes, either in cold seasons or in hot, in summer or in winter: we would not have referred it solely to inoculation, nor have affirmed, the seeds of it to be constantly lurking among us, produced for the first time, we know not how, about the days of Aristotle, ever since continuing in existence by contact or bite.

In assenting to this doctrine we should be involved in the same difficulties pointed out in our illustrations respecting variolous and other specific infections;<sup>p</sup> or we must admit, that in a country where this malady has once appeared, one or more dogs must constantly be under its influence.

To illustrate this, let us for instance suppose a dog raging under it in the east, who communicates it to others in the same, or some other county, where, by a similar communication, it reaches the west, turns to the north, sweeps back again, after a lapse of some time, or extends itself towards the south. Still kept in being, it disperses to a different district by the ramblings of an animal under it; then by  
an

<sup>p</sup> Vide page 164.

an equal accidental movement reverts again to the east, from whence it set out, ready to take a new course, and run the same wanderings over the same or other parts of the country not before visited ; and thus, without ceasing, from generation to generation, from century to century, we have a routine, constant as the perpetual motion, of one mad animal biting another ; an absurdity that would rather excite a smile than seem to call for a serious refutation.

If such really were the fact we should have long since been supplied with an established history of it ; nor would it have been left to conjecture to determine the manner in which the disease was propagated, because all must assent to what every one knew.

Surely it might be supposed, that in this zig-zag successive movement of the malady, though it might continue uninterrupted for some time, whether months or years, yet it might so happen, that every animal under it might suffer death without leaving the seeds of infection behind them. It is a possible event, nay I would affirm it frequently to happen. The link is now broken ; the disease needs no longer to be dreaded ; it is extinct.

Accord-



According to this doctrine it cannot be revived except by the same means as at first; a fortuitous combination in certain particles of matter having some connection with the canine habit. Granting it to be thus formed, a repetition of the same cannot be denied: and thus the disease may altogether cease for a time, then for a time be rekindled; cease again, and again be regenerated, according to existing circumstances, whether it be under the influence of a scorching summer, or the rigours of winter with intense frost; whether in regions under the line, or in very northern latitudes.<sup>9</sup>

This is exactly what I contend for, what it will be difficult to refute, and, as far as my investigation can proceed, what seems to be Nature's law.

Examining it thus as a poison, capable of being formed at all seasons, and in every climate, where all the circumstances unite to effect this process (though less rare in some climates and seasons than in others, and in  
some

<sup>9</sup> It is not a frequent disease in Sweden. (vide Swedish Transactions for 1777) The climate of Sweden may be called cold rather than temperate; yet since it does appear, though it be but seldom, it establishes the fact, that cold climates are not exempt from rabies.

some perhaps never, from the manner of breeding and feeding this animal) I can give credit to the fact which Dr. James relates of kennels retaining the infection for a certain time after all the infected dogs were destroyed, but not to the length that he affirms, viz. after washing, scraping, and fumigating the walls: for this, I think, must completely destroy it. If the gaseous oxyd be the infection, or forms the principal part of it, as we have found it to be a fluid somewhat heavier than atmospheric air, it may be precipitated on the ground or walls where these animals may breathe it, by this means preserving the infection longer in the place.

It is not a new observation, that it may be communicated by the animal's breath or vapour; it is possible though uncommon: for few dogs approach so near when under the disease, as to breathe on the animal they see without biting. The fact cannot be proved but in a kennel, where the mad dog is so confined as to prevent his biting, and the rest of the pack suffered to remain at liberty. James denies that the dog's breath can infect man. If the mad animal could be long enough detained so near as to breathe with full force for a  
certain

certain time on his face, so that the expired vapour might, in an accumulated form, load the air he breathes, or lodge about his lips and gums, it would excite my suspicions for the consequence.

If the poison of fevers can be communicated by vapour, and brought into contact through the medium of respiration with the lungs, or by deglutition with the stomach, analogy leads us to conclude, that concentrated vapour, highly charged with rabid poison immediately from the dog's mouth, would have the same effect; though it would be more certain by inoculation.

The gentleman who kissed his rabid dog before he sent it to be drowned, took the disease;<sup>r</sup> so did the Swedish boy, who slept with an infected puppy. Both, I grant, might have taken it by absorption, not by the vapour from the animal's lungs. The boy indeed complained of the creature's stinking breath.<sup>s</sup>

I have said the stomach; yet poisons, it is acknowledged, are resisted by this organ, unless they be of such a strength, like the oxyd of arsenic, that they produce sudden inflammation

P

<sup>r</sup> Vide vol. 1.

<sup>s</sup> Vide Case, Appendix.

mation and gangrene. In decomposing poisons of several kinds, whether conveyed by vapour, by fluid, or in a more condensed form, the gastric liquor seems to possess a particular power. The small pox is communicated by vapour as well as by inoculation. Sutton however could not communicate the disease by pills impregnated with the variolous matter introduced into this organ, and repeated experiment confirmed the fact.

Another auxiliary circumstance in tracing the remote cause of Hydrophobia in the canine tribe arises from the particular form of the skin, which is either wholly or nearly destitute of perspirable pores. This is an opinion of considerable antiquity. When observation becomes the basis of opinion it deserves credit; if credulity gives it birth, and a neglect of examination suffers its currency to continue uncontradicted from generation to generation, the first attempts towards eradicating the error will not pass without severe struggles on the side of prejudices in favour of the old. The different structure of the skin could not be hid from the most superficial observer, while he daily saw the different effects of exercise on the dog, compared with other animals. Copious  
perspi-



perspiration bedewed the surface of the horse, the ox, cat, &c. But from the surface of this animal none was apparent, let the exercise in the chace be ever so long continued.

A larger quantity of vapour exhaled from the lungs; and while his tongue lolled out of his mouth, as if more commodiously to catch the cooling air, the trachea seemed widened to receive an appropriated portion of the atmosphere to supply the blood, and to give exit to an equal quantity of noxious matter by each expiration. Thus, in a given time, an equal portion would be thrown off from the system by the increased frequency of breathing, as would have taken place had this been rendered unnecessary by the enlargement of the cuticular pores. It was obvious, that they would attribute some share of the hydrophobic malady to this peculiarity, especially as an increased quantity of foam was often a concomitant of *Hydrophobia*.

With respect to the proof of want of perspiration Boerhaave instituted an experiment. In his hands it turned out a confirmation of the old opinion. He put a dog, a cat, and a sparrow into a wooden cage, and placed them in the drying room of a sugar house, the heat  
of

of which was 146° of Farenheit's scale. After the dog had remained 15 minutes here, he began to pant and shew great symptoms of oppression and faintness. A copious saliva of a red colour, and a most fœtid smell issued from his mouth: shortly after he died; but it is affirmed without the least sweat. "*Ne minima quidem nota sudoris in hoc cane apparerat.*"

The cat which was inclosed in the same place sweated profusely, and was as wet, according to the author's phrase, as if drawn through a river. The sparrow died in seven minutes. The heat of the dog's body, at the time of his death, was 110°; the animal weighed ten pounds.†

The validity of this experiment however has been called into question. Later observations indeed militate against it. Had the dog been immersed in a glass bell (his head excepted) and detained there, properly secured, for an hour at least, free access being given that he might breathe the atmospheric air, as in common, a different result might have been discovered. The exhaled vapour would  
have

† Vide Chem., tom. I.

have dimmed the internal surface of the glass, and perspirable pores, though minute in proportion to other animals, have been detected. In this way the quantity passing off in a given time might have been calculated to the greatest exactness.

I do not recollect whether Linnæus made the experiment, but his opinion is in favour of perspirable pores: *vix sudat* are his words, plainly implying the discharge, though smaller than in other quadrupeds. The strong smell emitted from a dog, is brought as a farther proof; and as a still farther the print of his foot is asserted to leave a quantity sufficient to enable another dog to trace him at a considerable distance. Taking it without farther inquiry for granted, that diminished perspiration is supplied by a larger pulmonary secretion, and that a larger portion of saliva flows from the mouth, what effect are we to expect from this peculiarity in the dog in the production of Hydrophobia?

As a certain quantity of excreted and secreted matter must pass from the body daily, in order to keep in equilibrio the balance of health, and as certain organs are allotted for this office, should any of them be accidentally deranged,

deranged, we find, by a law in the system, the defect supplied by an increased secretion in other parts; and this continues to act till the recovery of their associate; and, like sympathizing friends, to alleviate the distress of a kindred intimate, they divide for a time the labour among them. Thus the urinary discharge becomes vicarious with that of the skin, and vice versa.

The lungs in like manner, being a large secreting surface, partake of this law, and assist in supplying the defect in the skin. Hence it has been supposed, that the quantity of matter to which the structure of the skin denied an exit, passed off in the dog by the urinary and pulmonary secretions. An increased vapour evidently issued from the lungs, and a frequency of passing urine above other quadrupeds, observed at the same time in this animal, confirmed the opinion.

In regard to the last, it has not been proved that the quantity of urine passed in a given time, exceeds in any great degree, the same in other quadrupeds possessing more numerous perspirable pores. His propensity to frequent micturition arises from the structure of his vesica urinaria. It is small and contains but little  
before



before irritation on the neck of this organ impels this animal to discharge what is collected. It is also of a more muscular texture, which gives an increased sensibility contributing to the same end. In animals where this vesica is both more capacious and more membranous, and whose diet and habits widely differ, especially in the latter, micturition was not so often necessary.

But the remora in the dog might have subjected him to inconveniences; for his agility might not only have been impeded, and thereby some interruption given to his turning in pursuit of the chace, by carrying for hours a quantity of urine about with him; but what might still be of more consequence, the fluid, like other inorganized matter placed in favourable degrees of heat, might become more acrid, according to common language, proving injurious to health.

The injury in this case would not be confined to the containing vesica; absorption would carry it through the system; for there is no doubt but this process takes back into the general mass part of the secreted urine, not only in disease where the delay of expulsion is sometimes considerable, but even in health.

The

The acrimony would be greatly increased from the nature of the food, (flesh) and should the animal be subjected to other occasional causes, such as hunger and cold, his frequent lot, the mischief would be heightened, because the same fluids would be carried back, and again secreted through the kidneys, when it would be returned to the vesica urinaria in a state still more disposed to putrefaction.

The late Professor Gregory attributed much of the cause of Hydrophobia to the structure and offices of the canine vesica urinaria. I shall not venture to determine how far his opinion is founded on fact. He observes, “you may take it for a general rule, that those creatures that feed upon animal food have their bladder more muscular, and considerably stronger and less capacious than those that live on vegetables, such as horses, cows, swine, &c. whose bladder of urine is perfectly membranous, and very large. This is wisely adapted to the nature of their food; for as in the first *all their juices are more acrid*; so, in a particular manner, their urine becomes exalted, which, as its remora might be of very ill consequence, must necessarily be quickly expelled. This is chiefly effected by its stimulating this viscus  
more

more strongly to contract, and so discharge its contents. And if these creatures, whose fluids have a tendency to putrefaction, are exposed to heat or hunger, the liquids must, for a considerable time, undergo the action of the containing vessels, and frequently perform the course of the circulation without any new supplies of food; by which the fluids become more and more acrid, the creature is apt to fall into *feverish and putrid diseases*, and in fact we find, that *these causes are sufficient* to produce that fatal and melancholy distemper, the *rabies canina, vulpina, &c.* in these animals; whereas those that feed on vegetable food seldom or never contract those diseases, but by infection."<sup>u</sup>

The quantity of vapour passing from the mouth, and the quantity of saliva to which dogs are subject, especially after severe exercise, were naturally referred to the law of *transposition*.<sup>v</sup> A part of the duty which should have been performed by the skin fell upon the pulmonary and salivary organs. This structure of the skin therefore led to the supposition that it contri-

<sup>u</sup> Vide Essay on Comparative Anatomy.

<sup>v</sup> Vicarious Discharge.

contributed to rabies; and observing an increased discharge of saliva when the animal was under this malady, this idea was farther strengthened. That a somewhat increased secretion takes place from the mouth of rabid animals of every species is a fact: but has the question been fairly put, from whence comes the discharge? Is it from the salivary glands, from the surface of the lungs and bronchiæ, or from the other passages in their vicinity, the œsophagus and stomach?

On strict examination, I believe, the salivary glands will be found but a distant agent, if agent at all, in the production of Hydrophobia. Little or no tumefaction is discovered externally in them. Internal of the mouth they exhibit no inflammation or enlargement sufficient to mark them as the principal seat of the complaint. They have been examined after death, and when cut through no traces of inflammation appeared, nor redness, more than a small extravasated watery blood issuing from divided vessels might account for; such as may be seen in cutting through a healthy part.<sup>w</sup> The pancreas,<sup>x</sup> generally

<sup>w</sup> Vide Dissections.

<sup>x</sup> Ibid, for healthy pancreas.



rally considered as the largest gland of a salivary kind in the body, has not, I believe, appeared on dissection diseased. Little therefore is applicable to the salivary glands, as far as dissection or their increased secretion discovers. The same may be affirmed of the pulmonary system. In some dissections indeed the vessels of the lungs have been found turgid with black blood; but other marks of injury attributable to this disease were not detected. The skin therefore, it would seem, as far as it contributes, from its scanty outlets, to throw a greater quantity of fluids on these systems, can scarcely be accused of being a strong additional remote cause of rabies. This structure is not disease, because it is natural to the animal; and granting a large secretion to the pulmonary and salivary systems in the dog, neither is this secretion disease for the same reason.

The animal however may be placed in situations where these increased discharges may favour the production of the specific infection, and as we see, become a ready medium for its communication. If a putrid ferment be acting internally, deleterious to the animal, the secretions under consideration may be altered. The pulmonary secretion is intended indeed to convey

convey from the body, especially the blood, noxious effluvia. The superabundant carbone, as well as other accumulating matter unfriendly to health when in excess, is, by this process, removed: but before they can communicate rabid infection, it appears to me they must mix with matters from the stomach, to convey virulence of sufficient strength to infect. Provided indeed the situation of the dog had been such for some time previously, that no new chyle was added to the blood, owing to deficiency of food, the general mass must thereby be in a condition more favourable to the production of disease, and must accelerate the completion of a process already begun. In this sense the pulmonary discharge is an acrid fluid, and must contribute its share.

The blood of a rabid dog, which appears to be changed in its component parts more than these discharges, and which is evidenced by its retaining sometimes fluidity after death; and sometimes by its black colour, and grumous consistence, is incapable of communicating the infection. A quantity of it hot from the vessels, in consequence of a sudden wound, has spurted into the mouth, and on the face of the person engaged in the destruction of a  
rabid

rabid animal, without being followed by the disease.<sup>x</sup>

In a word, though the form of the cuticle in this animal's body, may contribute in some small degree in subjecting him to the complaint, I consider it one of the least operating causes enumerated.

With respect to the urine, when retained longer in its natural reservoir than is consistent with health, and then re-absorbed; and again, by the usual secretions, falling upon the more delicate parts of the machine, it has frequently been followed in man with violent consequences. Translated to the brain, mania has seized the patient, and fatality soon ended the conflict.

The urine is the most speedily putrescent of all the animal fluids.<sup>y</sup> The composition is multifarious, and must give rise to a variety of new products. Already has it been selected and separated as a recrementitious saburra. If in man, a considerable part of whose food is vegetable, such baneful effects succeed its re-absorption, a similar re-absorption in the dog will

<sup>x</sup> Vide James on Canine Madness,

<sup>y</sup> Vide Plenck's Hygrolgy.

will be even a more active agent. This will be easily understood from the kinds of food consumed by this creature. Not only is it of the animal kingdom, but often their fœcal recrementals already in a condition poisonous to animal life. The retention and re-absorption therefore of urine into the habit cannot fail to be a powerful co-operating cause in giving existence to the complaint. Costiveness, a state to which the animal is prone, and is now become diseasedly augmented, is an internal cause perhaps even more powerful than the former by the long retention of a mass not less putrescent in the intestines, and along with this a deficiency of water, together with the heat of the season, must likewise be powerful in producing infection.

If infectious fevers can be produced in the human race by debility, or a long train of continued actions deviating from health induced on certain organs, the stomach and chylopoietic viscera for instance, gradually reducing the whole frame to a diseased action, without any contact or communication with external infection, diseases of a different species, by some small difference or variety in the products of the fluids, can easily be conceived to arise  
without



without external contact or infection with their external specific matter.

If the retention of hydro-carbonated and azotic gases around the body, to the exclusion of a sufficiency of vital air, accompanied with hot and moist weather, or with the scorching rays of a perpendicular sun, give birth to pestilential infection; if cold, moisture, vitiated air, and salted provisions give rise to another disease, the scurvy, once, but now much less the dreaded scourge of our brave sailors, we cannot deny, but under certain circumstances, the canine malady may be equally produced without the necessity of external contact with its specific matter. Small truly may be that variety in the component parts of the poison, which constitutes the foundation of a different disease. To investigate this will be an ample field for future pathological research.<sup>z</sup>

To sum up the whole; the remote cause is not to be found in one season, climate, or  
situa-

<sup>z</sup> Professor Mitchill's expanded ideas on the interesting subject of contagion highly merits the reader's perusal: nor is the public less obliged to the benevolent and patriotic Beddoes for the publicity he has given to this memoir, by inserting it in his *Considerations on Factitious Airs*, part 5, Appendix.

situation only, but in situations, seasons, and climates apparently opposite to each other; yet so connected with respect to animal productions, that an opportunity is afforded for the formation of the same species of matter. It may be connected with heat, and with its opposite, cold; with hunger, and high feeding; with want of exercise, and deficiency of water; with costiveness of habit, or with lodging in filth.

When the poison is once formed, inoculation may retain it in the neighbourhood for a time, but it must afterwards cease by the destruction of the animals which it infects; and at some interval, by a similar concurrence of circumstances, may re-appear, cease as before, and so continue alternating, or become extinct, in like manner as the typhus of the Old Bailey and other prisons; pestilential diseases; specific eruptions; the yellow fever, the late scourge of the western world; the plague of Athens, of Marseilles, or of London. To these and no other sources need we look for the remote cause of rabies in the canine race.



*Reflections on some Signs hitherto considered  
as distinguishing a rabid Dog-----Refutation  
by Examples.*



TO distinguish the disease in this animal in its earlier stages is of the highest importance to society. Every writer has laid down some rules by which the animal may be recognized when under the malady. In the last stage of the complaint the task is easy ; in the earlier by no means obvious. Some of our latest and most accurate authors have been led into error by giving too implicit confidence to the assertions of their predecessors, or from want of opportunities themselves of making more accurate observations. Even Boerhaave has committed this mistake when he asserts, that a dog in the first stage of madness will

refuse both meat and drink ; and Mead has likewise fallen into the same error. We are now in possession of several melancholy instances, where persons trusting to this sign have incautiously permitted the animal to approach them, and even caressing it while feeding have been bitten, and perished.

With respect to the former the case of Master Rowley is in point. From this example alone, not relying upon what authors had said, I attempted several years ago<sup>a</sup> to refute this commonly received opinion. The reader, by turning to the case,<sup>b</sup> may see, that so far from the creature refusing to eat when it rushed into the parlour where the accident happened, that on a plate of meat being set before it by order of the lady of the house, under the impression of its being a hungry stray dog, as it looked thin and poor, it instantly began to eat ; and it was in the act of caressing it while lapping that Master Rowley received the bite. “ The animal turned from its meat, and bit him on the right side of the lower lip.” It bit the French woman (a maid servant) a few

<sup>a</sup> Vide Remarks, &c. edit. 1, Ipswich, 1785.

<sup>b</sup> Vide Appendix.



few minutes before on her giving it victuals, but no notice was taken till it bit the young gentleman. The disease appears from this to have been in an early stage, and that its effects were chiefly observable from the animal's irascibility, and from the meagre and hungry look which first excited the sympathy of the family; for it attempted no farther mischief, but ran away.

If this subject needed more illustration, the autumn of 1795 furnishes me with two more examples.<sup>c</sup> These have already been detailed. The reader may remember, that the little parlour bitch not only followed her mistress while under the disease, on a visit, and returned with her home unsuspected of illness, but took its food as usual, though at this time it communicated the disease to a dog in the family, and bit one of the children, but happily without effect. It was after this likewise when the animal suffered its mouth to be forcibly opened and inspected, in order to remove the alarm of the family, as already mentioned in the history of the case. It was still later in the disease when it suffered itself peaceably to be  
tied

<sup>c</sup> Vide vol. 1, page 18.

tied up; and almost to its death, which took place on the chain, it continued to eat and drink.

The other example was even stronger, and more in point if possible; for the dog was tied up almost immediately after the bite; was kept on the chain till the termination of the disease, during which it ate and drank in the usual way till the night previous to its death, when its uncommon and melancholy howlings, altogether unlike the barking of an healthy dog, marked the creature's great sufferings, and the near approach of its end. To this I may subjoin the testimony of Dr. Bouteille, who also confirms the observation of brute animals having no dread of water while under rabies. He instances it in a mad wolf, which swam several times across a river; and asserts from his own knowledge the fact of several rabid dogs having drank water.<sup>d</sup>

The reader who has perused Dr. James's treatise, may recollect how the little dog is said to have refused the bread from the cowherd boy's hand, while it turned about at the same moment, as he caught it by the collar,  
and

<sup>d</sup> Vide Mem. de la Soc. Roy. de Medicinc, ann. 1783.

and bit him. This is the dog that followed the lady's carriage,<sup>e</sup> and attracted her notice so much on account of its courage, as she was inclined to believe from its running after, attacking, and beating dogs of a much larger size, and which she unfortunately took home; but soon found her mistake, as the creature no sooner entered her house than it bit not only one of her children, but herself dreadfully. He will perhaps, from this example, be inclined to credit the old opinion of mad dogs refusing to eat. The above cases however must outweigh all credulity, and confirm, with the unprejudiced, the opposite fact. Besides, this dog was not in an early stage of the disease, as is evident from his fury, attacking every animal of whatever kind which came in his way.

As to the refusal of drink, or the dread of water which mad dogs are said to have, it is sufficiently disproved in the foregoing examples. These animals neither refused drink, nor dreaded, nor shunned vessels of water set before them. I can give two more examples  
to

<sup>e</sup> At Medoc, near Bourdeaux.

to the same effect: Mr. Mills<sup>f</sup> affirmed to me, that he had a dog which lapped water in the last stage, and even a few hours before his death. Mr. Tufon,<sup>g</sup> who was then present, confirmed the fact from his own observation in other instances. Dr. James<sup>h</sup> also testifies to the truth of similar occurrences; for though he acknowledges to have seen mad dogs refuse both meat and drink, yet he never saw them express the least dread or horror at the sight of water or other liquids: on the contrary, he assures us, that he has himself seen mad dogs traverse water not long before their death. Dr. Mease,<sup>i</sup> on the authority of a friend,<sup>k</sup> relates an instance of a mad dog swimming across the river Petapsco, near Baltimore.

From all these instances respecting meat, drink, and dread of water, the inference is, that what authors have laid down as a general rule must not be taken as such, but considered

as

<sup>f</sup> A Clergyman in Suffolk.

<sup>g</sup> The surgeon who attended Master Rowley.

<sup>h</sup> Vide Canine Madness.

<sup>i</sup> Vide Bite of Mad Dog, p. 51.

<sup>k</sup> Mr. Andrew Ellicot.



as referable to the last stage ; and that even there it is not uniform : that though dog's occasionally near their death, or even a day and upwards before it, may refuse meat and drink, yet in the early stage there shall not perhaps be found a single example where these were rejected, but on the contrary they ate rather voraciously.

The next sign, which has been constantly mentioned as a proof of the absence of madness in a dog, is *fawning*. If a dog shows this mark of attention and kindness, suspicion of disease was totally removed. This error is fraught with great danger, because it tends to create a greater familiarity with the animal. We have examples sufficiently numerous in the histories annexed to convince us of dogs being infected, and inoculating the disease, yet fawning on their master or on others, and flying up to lick their hands in good nature. They have taken food when offered, without any perceptible change, appearing as in health, except in their temper, which is now somewhat more easily ruffled. This constitutes an early stage of the disease ; but it is this stage we should endeavour to find out, the more effectually to obviate the approaching evil. A  
future

future stage discovers itself unequivocally by several symptoms not to be mistaken.

When the dog becomes diseased a suspicious observer will mark it in his eye; he will mark it also by some changes in the animal's temper, perhaps by watching him in his sleep, in his gait as he runs, and also by slight convulsions, or symptoms of uneasiness in his dreams more than usual; for the dog is extremely subject to dreaming. Every observer of the habits of dogs knows this fact. In sleep he will bark, be angry, and growl; and in turns seem pleased, as if conferring and receiving caresses, or enjoying some grateful food. The emotions created by his passions under the influence of sleep are very evident. You may discover his sensations of pleasure, of pain, of joy, or of grief, by his dreams. I have frequently amused myself by interpreting his ideas in this state, and have followed him through the chace, or observed him in contest with some enemy. I have heard him howl from the supposed wounds he received, start from his sleep in anger, and instantly recovering his recollection, look, as it were, ashamed at the imposition he was under, and the mistake of his passion

sion, then faunter once or twice round the room, lye down, and sleep again.

A dog in madnes has been observed to suffer slight convulsions in sleep, to moan and grunt frequently.<sup>1</sup> A change in the appearance of his coat is very early discernible; it is less smooth, while the creature itself seems somewhat shrunk. There is some melancholy in his aspect more than heretofore. When he runs or walks it is with his tail drawn between his hind legs, in the manner a dog is seen to do in turning away from a person affronting him. Other dogs are said to shun him; but there is by no means sufficient evidence of this in the early stage of the complaint. I should be unwilling to trust to this dubious mark. In a later stage it may be true. In the instance of the little dog following the lady's carriage near Medoc, the dogs whether large or small, strong or weak, ran from him as he approached. This dog however was evidently in a late stage of the complaint. His tongue is said to have lolled out of his mouth, which, from observation, never takes place but in the last stage. He had deserted home, had  
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<sup>1</sup> Vide vol. 1, page 20,

forgotten his master, and lost all recollection of his former residence, which never happens till the disease has gained great strength.

To conclude ; it will be safer to trust, as a mark, to the changed habits of the animal, than to the three negative instances too much relied on by authors and others, that if a dog takes food, and drinks or fawns on, or caresses his master or the family wherein he is kept, he is free from the malady, and cannot infect. The omission of barking under the disease is another of those dubious signs which authors lay down as one of their general rules. They are here, as in the foregoing, right in as far as respects the last stage. I recollect no instance where the victim of the animal's fury is at this time warned by previous barking. For the most part he is suddenly assailed, and often neither suspects nor sees the animal, till he feels the pain of the wound, which is given from behind. But this is not an universal rule. In the early stage the animal has forgotten none of his usual habits, and a stranger may be assailed by previous barking, and afterwards wounded. This it is incumbent on him to keep in view. The creature indeed is more apt to snarl from the change in his temper at  
strangers



strangers or others, and even by a trifling provocation, than when in health. I know not whether Lommius speaks from experience, but he expressly mentions the barking of mad dogs. From their manner of barking, it is said, other dogs are enabled to distinguish the disease. This prompts them, to fly from them with precipitation and horror.

Let it be remembered as a caution of the highest importance, never to approach a strange dog with familiarity, even though accompanying his master, though possessing every apparent mark of health. Still less, if possible, ought we to approach a strange or stray dog, but shun him by every means in our power. Should a dog occupy the footpath on which I am to pass, I should rather choose to take a wide circle round him, than run the risk of rousing, and turning him out of my passage. Dr. J. Hunter assures us, that in most of the instances brought before their society the disease was contracted by approaching familiarly strange dogs.

In every case of suspicion let our first endeavour be to secure the animal by an iron chain. I should be unwilling to trust any material more penetrable by the teeth. Hemp  
or

or leather may be gnawed through or broken, and the family, should the animal become mad, be thrown into imminent danger. An accident of this kind took place with one of the dogs already mentioned.<sup>m</sup> I have seen strong pieces of wood gnawed nearly through by the violence of the animal in struggling to break from his confinement; and I have seen marks of his tusks left even in a piece of iron chain. All however are not thus furious, for some die without much struggle.

Suffer no suspicious dog to be killed. To destroy the animal is both unsatisfactory and cruel. The security obtained by this arbitrary proceeding is neither politic nor merciful; nor have we greater safety than by the more prudent and œconomical method of chaining. Let the animal be fairly tried for his life, and let his *jury* be time. Three weeks or a month is all the imprisonment necessary; for much beyond that period there is no instance of an infected dog surviving.

A suspected dog appears in the village; he may be mad or otherwise; he may bite many; he is a strange dog, and running at large; it is prudent and proper to destroy him as soon

<sup>m</sup> Vide vol. 1, page 24.

as possible. I beg not his life: this act is mercy, as it ends his career, prevents danger, and shortens his existence but a trifle should he be mad. Do not however, as is usual, proceed to massacre all the dogs of the town. A short imprisonment will decide and distinguish the infected from the sound.

It is no less improper to destroy your own dog, should he be suspected, or have accidentally bitten those of the family. By his death the truth cannot be ascertained, though his imprisonment will accomplish it. Lately<sup>n</sup> a massacre of this kind took place here;° nor was I able to save my own spaniel, then condemned with others, said to have been bitten by a suspected dog passing through the town.

Dogs are subject to various diseases besides madness, neither infectious nor dangerous to others. A dog is to many of great value, and they sell frequently at a high price. I have known from two, to six, or ten guineas paid for a pointer; and I have heard young sportsmen speak of much higher prices.<sup>p</sup> In the  
light

<sup>n</sup> Summer of 1795.

° Ipswich.

<sup>p</sup> DASH, a favourite and well-famed pointer belonging to Lieut. Colonel Thornton, of Thornville Royal, in  
York-

light of property alone the loss of such a dog is considerable. Shall bare suspicion then rob me of it? This is unjust to me as a citizen, and cruel towards the animal as prejudging his life. Suspicion merely, whether well or ill founded, ought not to determine the act; security will be as well obtained by the chain as by either the halter or bullet.

Some timorous persons are easily alarmed, and are ready to execute, on the slightest occasion, this final doom. If examples of mercy were necessary, we have an excellent one by Dr. James, whose knowledge of the œconomy and diseases of dogs, and prudence at the moment of a rash resolve, saved the life of a little bitch under a fit of convulsion.

He walked one day with a friend towards Highgate; they were followed by a little bitch that a few days before had lost its puppies. Maternal affection and melancholy had reduced the creature into a state of disease which  
was

Yorkshire, was sold to Sir Richard Hill. Bart. for 120 guineas, and a cask of genuine Madeira; and, after breaking his leg on the Moors, was re-purchased by the Colonel, agreeable to a stipulated condition, for 50 guineas, as a *stallion* to breed from, and considered in that state a great acquisition. Vide *Sporting Mag.* for April, 1796, p. 20.



was marked by stupor, heaviness, and occasional convulsive fits. While its master and the Doctor continued their walk it fell into a fit, and showed symptoms not unlike madness. In this, recollection was lost, and the animal answered not when called by its name. It even ran away to the distance of a quarter of a mile, and couched on the edge of a ditch. Terror seized the master; he would instantly have killed it, but James repressed the blow. They pursued the animal, and with much trouble coaxed it to follow them. In the interval of this fit its recollection had somewhat returned. Passing on they came to some hay-makers, one of whom was entreated to bathe it in a pond which was near. The man, by putting his fork under its collar, lifted it up, and plunged it into the water, from whence, after struggling a little time, it swam out, and was cured of convulsions, and remained in health long after.

A farther inconvenience attends killing a suspected dog. Should a bite be accidentally received, a dread of the consequences must dwell on the mind, which from a contrary practice, if the dog was not mad, would in a short time be dissipated. This is a much better

better security, and affords more satisfactory information than the dubious test advised by the Academy of Sciences. There a piece of boiled meat is directed to be rubbed on the teeth and gums of the dead animal, and to be offered to another dog. Should he be affected with madness, it is affirmed, that the dog to which this piece is offered, will fly from it with horror, barking and howling: if not mad, he will instantly devour it.

If, by the precipitate outrage of the populace, a strange dog be hunted down and killed, under the idea of madness, this test may be applied; but if the animal, either through rage or otherwise, has bitten other dogs, the test to me would not be sufficient; nor should I be contented with less than confinement on the chain.

It may be thought unnecessary to waste the reader's time on a superstitious error respecting the liver of the mad dog being an antidote to his bite. Thousands of innocent dogs have fallen victims to this erroneous notion. At this day, among the common people, it is far from being eradicated. I had a marked instance of it some years ago. A man was bitten by a neighbour's dog; whether by accident

dent or provocation I know not. The alarm instantly spread, that the animal was mad. Rage, fury, horror painted the poor man's visage; already he anticipated his miserable end.

The populace assembled, and at the man's entreaty imperiously demanded the dog's life, that the liver might be eaten by the wounded person. The owner of the dog refused compliance, shut his doors, and from his windows begged them to desist, assuring them the dog, which was then by his side, was not diseased. It would not do; they threatened his house with destruction if he persisted in refusal.

Passing through the street at the same time I mingled with the multitude, inquired the cause of the tumult, and obtained access to the bitten person. The fury of his aspect, and the convulsive agitations of his whole body struck me with such horror as almost prevented my addressing him. After some fruitless efforts I gained his attention, and assured him I should see his request complied with, if he still persisted; but ventured to tell him, that chaining the dog was preferable; for if he was mad it would soon appear, and  
R
then

then the liver should be given: if otherwise there would be no grounds either for the alarm, or the dog's death. By this he was appeased, the populace satisfied, and the owner readily agreed to chain the dog. The creature was free from disease. I attended the poor man daily for some time, till his mind was restored to quiet, and a fever, into which his agitations had thrown him, was removed.

He who has seen fear in its greatest force, as in this instance, can have but a faint idea of what it can produce on the human body from the most animated description.

In a second instance, where a dog bit a soldier, and where the creature's liver was also demanded, I caused the animal to be tied up for several weeks, and thus relieved the poor man from apprehensions, which might ever have remained with him, as well as saved the animal's life.

From the nature of a physician's duty, he has oftener to combat superstition, prejudice, and vulgar error, than other men pursuing different professions; but he should persevere. The anniversary of a bite from a suspected dog, or the influence of the new and full moon are farther



ther superstitions occasionally haunting weak minds. These are real evils; and while the persons believe in their truth they render them completely miserable, as if the opinion was founded in fact.

Mrs. Bellamy suffered for several years,<sup>1</sup> as she declares, under the impression of the appearance of Hydrophobia on the annual return of the day on which she was bitten by her lap dog.<sup>2</sup>

Others have felt an unceasing apprehension at the returns of the new or full moon, from the current belief, that the infection, were they previously bitten, would be rendered active, and excite the disease at these times; while another set again had their whole lives embittered from the time of the bite without intermission, relying on the stories they had read, or were traditionally handed to them, of the possibility of the latent poison exciting the disease at any future and undetermined period, for sixty years, or even the longest life. One respectable person I have been happily able to relieve from this last forlorn

<sup>1</sup> Apology, vol. 4, page 137.

lorn impressiion, as has already been related.

The erroneous notion, I trust, will soon be completely removed from every rank and every denomination of men.

*Some*



*Some Rules for obviating Infection in Dogs,  
or dissipating it from infected Places where  
they are kept.*



A Few hints on this subject is all I intend. It will be apparent that diet and cleanliness embrace almost every thing necessary to be advanced on this head. The rules generally laid down for dissipating or obviating infection among the human race, will apply, with little variation, to our domestic quadrupeds.

As the dog has little restraint over his appetite, it will be necessary carefully to regulate not only the quantity, but the quality which he daily consumes. On this head dog-feeders are constantly committing errors. Horses or other animals dying by accident or disease are, for the most part, purchased both  
for

for the use of the kennel, and for the food of our more domesticated dogs. To this little objection could be made were the quality of the carrion kept in view.

If the few observations already given on the nature of animal poisons, and the process of putrefaction in dead animal matter be recollected, we must at once perceive of what importance the quality of their flesh meat is to their health. It is not necessary to recapitulate what has been said respecting the generation of poisons, as produced by new combinations of different materials, loosened from the bonds in which they were lately held under the form of organized bodies, and now speedily passing into other forms. These not only may, but really do, in certain favourable situations, become new-modified and highly deleterious when mixed with the fluids of living bodies. We have rendered it probable that the hydrophobic, as well as some other poisons, is formed in this way. Nay, it is equally probable, they become this or that species of venom or infection merely by some accidental variation in the proportions of the same materials. If this be granted, one of the principal rules of obviating this infection

will



will consist in denying our dogs flesh far advanced in putrefaction.

Little attention, generally speaking, is paid to this rule. Is it not common in families where several dogs are kept to observe carrion, purchased from some neighbour having the misfortune to lose a horse or other animal, dragged home and deposited in some spot in the open air, or corner of a farm yard or orchard, and there remaining to putrify in the most nauseous condition till the creatures can consume it? I have seen, not unfrequently, even the quantity of a quarter of carrion suspended upon the branches of a spreading tree, convenient to the kennel or dog house, putrefying and tainting the air to a considerable distance, even rendering it unsafe to be breathed, from which a part was daily cut down for their consumption. Can dogs, fed in this manner, and at the same time prevented from exercise by being chained, be long preserved in health? The thing is impossible.

Reflect on the process of animalization, and you will easily see how unfit it is for the purposes of life, for the renewal of those parts every moment undergoing changes, and becoming

coming defective by other processes again constantly and necessarily carrying on for animal preservation.

If to such food of improper quality be added a quantity more than proportioned to the real demands of hunger, the mischief accumulates. Suppose the animal be fed on offal fresh from the butchery, the condition is barely meliorated; for the putrefaction of these parts,<sup>r</sup> from their spongy texture, is extremely quick. When want of exercise and a costive habit are united, the seeds of disease must be rapidly generated. Let it then be a rule to regulate this part of their food. In vain will it be urged, that the dog delights in carrion, or that his natural propensities lead him to prefer it, and therefore what nature propels him strongly to cannot be injurious.

It is to be remembered, he is a voracious animal; will feed to the utmost extent of satiety if left to himself, till his stomach even disgorges the uneasy load; and so filthy likewise in his natural habits, that he will frequently return back into his stomach its newly dislodged contents.<sup>s</sup> On this account prudence

<sup>r</sup> Tripe, liver, lights, &c.

<sup>s</sup> This observation has been long made. "As a dog returneth to his vomit; so," &c. Prov. xvi. 11—2 Pet. ii. 22.

dence will dictate not to permit the animal to be guided by his appetite, over which he has so little controul. We must become his caterer; we must put him under a proper regimen, neither too meagre nor defective in nutriment on the one hand, nor too abundant, nor of the quality now described on the other.

Did my inclination impel me to keep a number of these animals for my amusement, I should be extremely circumspect in what relates to this part of their diet. They should have their *meagre* and their *meat* days; or, as I shall express it, their *fasting* and their *feasting* days. The quantity likewise should be under strict regulation, and should be more or less according to the size, &c. of the animal.

Although the dog be a flesh eater the mechanism of his stomach does not exclude him from vegetable diet. A proper portion of this should be added. Nor should I permit my dog on his meat day to receive it undressed. The process of coction renders it more digestible and less putrefactive. Broth, with boiled barley, peas, and vegetables, wherein a certain portion of meat is shreaded, and boiled down, and thickened still farther with potatoes, should in my opinion, form one of his prin-

principal meat-day meals. It is now well understood how nutritive and wholesome the potatoe is, not only to man, but to his domestic animals of every species. I know the dog is fond of, and will thrive well on such a mixture; and I am persuaded likewise of its greater cheapness than the raw offal, or corrupted carrion in common use.

Milk, I believe, is used in considerable quantities in the kennel. I approve much of the diet, but it is expensive. I know sportsmen in this country who keep a number of cows chiefly for the pack. A pottage of barley meal and water of a proper consistence, and a mixture of milk will form an excellent repast. Some use a quantity of blood from the slaughter-house. This is extremely nutritive, even more than common flesh; but it is speedily putrescent. If it be convenient once a week to feed with it, I should recommend the preparation to be managed with strict attention; for I should not suffer it to be given them unboiled.

When received warm from the slaughter-house it should be squashed and broken down by constant stirring, as it cools and coagulates, that the serum, coagulable lymph, and  
red



red globules may be mixed equally together. In this state, with the addition of a little common salt, it will keep free from putrefaction a day or two, or even longer, according to the weather. It should be mixed with some water, or milk, or both, when it is about to be boiled, and a quantity of barley meal stirred in to give it the consistence of a thick jelly when the coction is complete. This will form a nutritive and wholesome diet, being a composition of animal and vegetable matter.<sup>t</sup> In this manner his diet may be varied, the purposes of œconomy served, and the dog enjoy better health than when a greater part of his food consists of putrid raw offal, or more putrid carrion.

If it should be objected, that a diet thus prepared will be less suited for the quickness of the scent necessary in the chace, or for the fierceness of the house dog, I answer, there is no proof, that the huntsman will find it so; or that the master of a tan yard, or other office,  
where

<sup>t</sup> A composition on this plan is used for food both among farmers and the poor, not only in parts of Scotland, but in the North of Ireland; and in the palatable manner it is cooked, intermingled with savory herbs, it becomes both a grateful and wholesome dish.

where his dog is sentinel, will find him less active in opposing the thief. Let his vessels be sufficiently replete with nutritious juices, and neither vigour nor courage will be defective, while, by this means, we shall have the certainty of preserving him from diseases to which a more alkalescent food must render him obnoxious.

My next rule respects costiveness. To man or to quadruped this, long continued, is a dangerous state of body. When the lacteals of the intestinal canal have selected the nutritious particles, the feculent, or more putrescent parts remain in the gut to be carried off. If they are detained beyond a certain time in a situation so favourable for corrupting the body, it will be in imminent danger.

Let due attention be paid to the state of their bowels. Should the plan of feeding be insufficient, medicine must be interposed. Mercury, I believe, is principally administered. Turpeth mineral, or an union of this metal with the sulphuric acid, was strenuously advised by James. He considered it indeed both as a cure and preventive of Hydrophobia. In as far as it cleansed the alimentary canal it prevented disease; so would any purgative. A  
mix-

mixture however of jalap and calomel I do not think inferior, and perhaps it possesses a more drastic power, not unuseful by unloading the cerous arteries, while it discharges the feculent matter from the tube.

Another rule, equally necessary, relates to water. This is the natural beverage of the dog, as it is of most other animals. It is as necessary for his health as food. When treating of the remote cause, we found it to be one of those absolute necessities, a deficiency of which is highly detrimental. This should be pure as well as in due quantity. To kennels it ought to be supplied daily in stone troughs, or other conveniency, that the animals may drink when they please. To pointers, spaniels, greyhounds, &c. on the chain, the same care is necessary. And to these it is to be feared, that the want of attention in servants is oftener experienced, arising from their other avocations, than to those in the kennel, where particular servants are appointed for the superintendance of the pack.

I have often felt myself hurt in passing the little habitations allotted to these animals, which for the most part are of the size to admit only one, or sometimes two, to observe them

them panting in a warm day, their tongues lolling out, and their eyes glistening, without a particle either of food or water within their reach. The former indeed may be supplied without detriment, at regular periods, but the latter they should have constantly near them.

The ancients seem to have had good reason for attributing to a deficiency of water one of the remote causes of rabid virus. It is not necessary in this place to recapitulate the mode in which water may tend to obviate the production of this poison. Azote, or septon, is the most plentiful material of animalization. If sufficient water be supplied, the hydrogen disengaged by decomposition will readily unite with it, and also with the superabundant carbone; and both oil, useful to the machine, will be formed, and volatile alkali be carried off.

My next rule relates to exercise. There are few animals formed more for activity than the dog. His natural propensity is hunting; and if he were at liberty and undomesticated he would acquire his food by the swiftness of his foot. This should teach us to alternate his confinement with a due portion of exercise. It is impossible for any animal long confined  
to



to be in health. The different organs cannot duly perform their functions without exercise. Some parts altogether necessary to life, are so far removed from the source of circulation, that without the motion of the body the fluids must be interrupted in their course, and disease be the consequence.

It will follow, that according as nature has given to the creature necessary powers of activity for its own existence, in proportion will its confinement be detrimental. The necessity then of considerable exercise to this quadruped must be apparent. We have reason to presume this rule to be greatly transgressed in this instance.

The dog, above all domestic animals subservient to man, suffers the greatest portion of imprisonment. The horse, the ox, the sheep range in our pastures; even our domestic cat is not subjected to confinement; while the dog (the sportsman's dog) is either locked up in the kennel, or confined within the bounds of two or three yards of chain, to his little six feet cell sometimes for weeks, with little intermission. How often are our ears assailed with their melancholy howlings as we pass! They listen with attentive ears to the tread of  
every

every foot, and watch the approach of every passenger, to whom, by their moanings, they endeavour to tell their sufferings, excite his sympathy, and implore his aid.

Among the causes likewise contributing to canine virus, confinement has generally been enumerated. In the season of field amusements this does not happen, because they are exercised for their master's amusement. In the summer however this is a frequent practice; yet from the heat of the season confinement becomes still more irksome. He frets on his chain; and in consequence of this irritation derangement both in his solids and fluids, and disease must follow. I would warn the sportsman against this practice. I believe it is customary with many to disperse their young dogs through the neighbourhood, and board and lodge them with little farmers and cottagers of their acquaintance; but after a year old, or earlier, when the dog is *made*, as they term it, this is seldom practised. His summer is principally spent on the chain, if a pointer, spaniel, &c. but if a fox hound or harrier, in the kennel. From this confinement results another inconvenience; want of cleanliness.

This

This subject gives rise to another rule, and one which requires our attention in no less degree than the foregoing. From the strong smell natural to dogs, proceeding principally from the effluvia of the lungs, we learn, in some measure, its deleterious quality. From the confined situation in which they are placed, and from the great quantity daily exhaled, we may perceive how soon their cage (for it is generally close boarded, pitched over, and weather tight) together with the straw on which they lie, must become surcharged and tainted with this, as well as with their other excrementitious discharges.

It is well known how speedily an animal, if closely confined in his own effluvia, and cut off from the atmosphere, will perish. This suggests the necessity of free ventilation, and change of litter. When we carry this idea to the kennel, the necessity of the rule becomes even stronger, and proportionably so to the smallness of its dimensions. Here we have from twenty-five to thirty couples constantly under the same roof, which, like a chinese house, consists, for the most part, of but one low story.

If proper attention be not paid to ventilation, the quantity of excreted matter from the lungs and surfaces of so many animals, must in a short time favour the generation of infection. I could wish therefore the kennels to be supplied with a stream of running water, or that it should be so contrived, that a small rivulet, confined within proper channels, might uninterruptedly flow through it. The constant motion of the air in the place by means of the current, and the changes that would follow, must tend greatly to destroy this poison almost as quickly as it is formed, while at the same time the stream would supply drink.

A dog bath should be one of the conveniences of a kennel, never, in my opinion, to be omitted. His skin is often thickly covered with dust, which if not washed off occasionally becomes interwoven with the roots of the hair, and being in a situation to partake of the heat of the animal's body, cannot fail not only to check the egress of perspirable matter, which, it is now agreed, dogs emit, but by putrefaction must become an assistant remote cause of disease. Bathing therefore under this view,  
must



must be highly useful in removing from the cuticle this putrescent covering

In another view it is no less beneficial; it is a preventive, and perhaps likewise one of the most certain remedies for some kinds of convulsions to which the animal is liable. Even without proof, analogy with the human body would have led to this conclusion. Some of our own most dangerous diseases of this class (the tetanic) are removed by cold bathing. The instance however of its efficacy in the dog does not leave us to analogy for proof, but gives us the direct fact.<sup>u</sup> Let it therefore be a constant rule to plunge the dogs into cold water frequently, and to take some pains in clearing the dirt from their hair. Nor should I deem it an useless labour to rub each dog coming out of the water with coarse canvass or clean straw to dry his coat. When this operation is finished the dog should be aired a little, but the exercise should be gentle.

I would follow, with little variation, the same method after bathing, with respect to exercise, as in our own species. The sportsman will profit by this rule; his dogs will

<sup>u</sup> Vide page 238.

will be in health when the season invites to the field. The rule equally applies to every species, down to the young lady's lap-dog, and pampered companion of the elderly maiden. Often have I pitied the unfortunate animals, whose lots fell to their imprisonment. Stuffed with dainties, as improper for them as carrion for the human species, they contract diseases at an early period. Go into the parlour of a genteel family, and on a cushion in a corner, for the most part, you may observe one or two such, suffering the tortures of asthma, and loaded with fat, the forerunner of disease. Wines of delicate flavour, and dishes highly seasoned are kept for these favourites. I have seen them sometimes cloathed in expensive garments, and adorned with trappings of considerable value, in defiance of nature and common sense, v

Turn your eye to the gate of the mansion, and not a day shall pass without seeing the naked as well as hungry children of the poor  
cotta-

v The reader may remember the various anecdotes, some capable of exciting laughter, others indignation, mentioned in the debates of the House of Commons on the dog-tax bill. Few will be found, who, from their own observations, cannot verify them.

cottager, whom far less expence would feed and cloath comfortably. The performance of this task would reflect a different lustre if transferred from the dog to the village pauper. I do not mean to accuse the lap-dog-loving part of the present age (a numerous class) of want of charity; I must not doubt but they dispense it liberally, but I accuse them of transgressing nature's law, in conferring on the dog the attentions proper only for their own species. Let the ox have his hay in the crib; the horse his oats in the stall; and the dog his proper food in his proper place, his cell or his kennel.

There is a species of French dog imported into this country, which for some time, for the beauty and length of the creature's coat, and its playful liveliness, has become a particular favourite with many. This species is to be found now frequent even among the middling classes. While the spaniel, pointer, or greyhound lives in his kennel or cell, this little foreigner amuses the family in the parlour, and has the privilege of dining there.

I have observed this poor animal doomed to great sufferings to preserve the whiteness of his coat. Once a week it was washed (not bathed)

bathed) with soap and water. Here was no great impropriety, but in what followed there was much to condemn. No sooner had the maid performed the proper ablution, than it was carried immediately to a basket prepared for the purpose, wrapped in blankets, with part of the head only left uncovered, in a close and warm room, where it lay for the purpose of drying, in a degree of heat sufficient to excite a fever. Such creatures, as it might be expected, became delicate and debilitated. I have been told of some whose sagacity led them to distinguish this day of *ordeal* from the rest of the week, and, dreading what they were about to suffer, would sedulously watch a favourable opportunity to seek concealment, from room to room where they could find an entrance.

I would suggest to the possessors of these beautiful animals, that the mode of cleansing here adopted is highly injurious to their favourites; and while it torments them by breaking down their constitutions, defeats, in a great measure, the end for which it was employed: for want of health will soon be followed by want of beauty. Where the animal pants with a fever weekly renewed, the  
 parched.



parched skin must wither that coat of hair on which they set so high a value.

But to return; in the management of dogs of all kinds, let their masters guard well against infection. Let no attention be omitted, which circumspection can supply, to obviate its generation in the dogs themselves, and in their habitations; or its introduction by communication with others under disease.

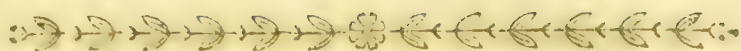
The last rule which I shall lay down on this subject relates to quarantine, or the keeping separate from the old pack new dogs, for a certain period, till their health be ascertained. This has been found an useful practice, confirmed by considerable experience. One of the first sportsmen now in England<sup>w</sup> has, for a series of years, kept his kennel free from rabid infection by this means. Till this plan suggested itself his dogs frequently went mad. The time the animal is to be under judgment need not exceed three weeks; at the utmost four.

On a very probable estimate we may conclude, that where one dog generates the disease, many hundreds receive it by derivation.

So

<sup>w</sup> Mr. Meynell.

So widely indeed may it ramify by inoculation, that several months may elapse before the infection from one stock be completely subdued. We have instances of its continuance for even nine months. A number of coincident circumstances must concur to form the primary infection. They can happen but seldom; and happy this is for mankind! The inoculated disease spreads with rapidity. It is much more difficult to guard against the latter than the primary. A moment may communicate the one in spite of vigilance; but the other requires time to arrive at rabid strength. By our mode of feeding, lodging them, &c. we have it in our power to prevent its generation; and by strictly observing the rules recommended in these pages, we shall, I would say, almost to a certainty, obviate those dreadful effects experienced from rabid virus in so many instances.



*Worming of Dogs, as preventive of their becoming Hydrophobic, considered.*



A Few words in the present day might suffice on this part of our subject. It might indeed be totally passed in silence, as a practice altogether nugatory, and generally now considered in that light. But the time is not long since a contrary opinion was held even by men of a superior understanding. Among some however whose province is not peculiarly the study of medicine, this opinion still holds its ground. For the satisfaction of these I shall enter a little into explanation, and point out the sources from which this error has been derived.

Prior to the days probably of Pliny the younger, credulity had laid hold of this notion,

tion, as preventive of a malady which so often occurred. In a great part of his natural history he only collects together things he had either read of, or seen; and among these, it is but reasonable to conclude, he had seen the practice of dog-worming. He has been however but short on the subject; yet here, as in many other parts of his work, he is decisive in his opinion, though erroneous: "*Est vermiculus in lingua canum, qui vocatur a Grecis Lytta, quo exempto infantibus catulis, nec rabidi fiunt, nec fastidium sentiunt.*"\* Here is the whole passage, to which not only our forefathers, but ourselves, have paid, even to the end of the eighteenth century, and in the face of physiology, implicit obedience, and given to it without farther examination, a stupid belief.

Some few however must be exempted from this charge, who have ventured to assert its insignificancy. Among these James is to be reckoned. It is well known he was famous throughout Great Britain for his supposed knowledge of canine diseases. After giving a description of the manner commonly practised by

\* Vide Plin. Nat. Hist. lib. 29, cap. 5.



by village dog-doctors, who, in conformity to this opinion, elevated the substance denominated a worm on the point of an awl, or some such instrument, and thus extracted it from the tongues of puppies. But he expressly testifies, from his own experience, the futility of the operation, either in preventing the disease in question, or of rendering them dull, mute, or unable to bite. "There is no worm in the part," (a very obvious truth to an observer) "I firmly believe, and consequently none can be taken out." The operation makes their mouths sore, and may prevent them from gnawing whatever they meet; and if any good be derived from it, it is the breaking them of this habit. But the punishment is far from proportioned to the offence; for the animal remains mutilated through life to obviate a trivial inconvenience.

If no benefit can be derived to society from this operation, why inflict pain on our domestic companion, whose fidelity attaches him so closely to us? Nature forms nothing in vain; this organ must have been given for useful purposes to the animal, the loss of which must be to him an evil. Two of the three pairs of glands destined for the secretion of saliva, have  
their

their ducts opening in the tongue, viz. the submaxillary, which open on each side of the frænulum, and the sublinguals pouring forth their contents from a number of small rivuli, or openings at the tip of the tongue. In extracting the substance denominated a worm considerable injury must be sustained by these ducts, and the salival discharge thereby disturbed, which must be seriously detrimental to the animal. We are not justified then in continuing this unnecessary mutilation and cruelty, for we shall make it appear so in the instances now to be annexed.

Dr. James considers the substance extracted from the tongue as a *nerve*. Here however he is mistaken, it wants even its similitude. When cut out it contracts, and this is believed by the credulous bye-stander to be a proof of its animation and vermicular nature. A nerve when divided becomes somewhat elongated, and is pulpy and soft; but this, besides retraction, is considerably hard.

Dr. Brodie differs from others in his opinion of it. He thinks it to be gland. On this supposition he has imagined, that there may be truth in the common notion, that wormed dogs do not run mad; or if they should go mad, as  
 obser-

observation proves to be the case, they are thereby rendered incapable of communicating the disease.

Those who support the idea of its being a gland, argue, that it is necessary for the separation of the poison at the mouth. If it be extracted, say they, the poison therefore cannot be communicated, because the organ necessary to make the separation does no longer exist. This, no doubt, would have been sound reasoning had the foundation been firm: but this happens not to be the case; the thing itself is not true: it is no gland. This part of the argument should have first been well examined, and then there would have been more certainty of the security of the building, which, unluckily, for want of this precaution, tumbles at once into a ruinous heap. In the first place, it is not like any other gland in the body. No duct has yet been discovered going out from it, by which, like all glands, the excreted liquor is to be carried away. It becomes indeed the very essence of a gland to have a duct: this having none is sufficient proof of its being no more a gland than a worm.

Morgagni, who has taken some pains in its investigation, thinks it composed of tendon  
and

and ligament, and hence denominates it *tendinous ligament*.<sup>y</sup> The naked eye indeed can distinctly trace these two substances, of which this eminent anatomist thinks it to be composed, separately in a longitudinal direction, and parallel to each other.<sup>z</sup> The one appears clear, and semi-transparent: the other dark in its colour. The tendon ends with the body or bulky part: the ligament grows smaller, and leaving the tendon behind, runs out alone, in length near an inch, in one now in my possession, and small, like a fine thread, or rather hair, to connect itself with the substance of the tongue towards its root. What may be the real use of this little organ in dogs I shall leave to the determination of more accurate physiologists; but that it is for a different purpose than what many attribute to it, appears both a probable and rational conclusion.

There is an evident disproportion between the cause and the effect which is said to be produced, in attributing to the extraction of this little substance the prevention either of madness, or of the animal's incapability of  
biting

<sup>y</sup> Vide de Caus. & Sedib. Morbor, lib. 1, epist. 8, 35.

<sup>z</sup> Vide plate annexed.



biting when rabid: but with arguments alone I did not content myself. I was infligated more particularly to this by anonymous letters addressed to me, in attempts to refute my opinion on this head, which had been made known some time before.<sup>a</sup> I directed my inquiries therefore to the discovery of facts, and was fortunate enough to find, a noted dog-wormer in this place,<sup>b</sup> who amply satisfied all my doubts, by positive examples within his own practice.

He wormed a dog for one Cutting, a butcher in this town. The dog not only went mad, but bit a cow, a gander, and a favourite spaniel of his own. The cow and the gander went mad soon after, and to prevent the same event in the spaniel he shot him.

Two other dogs which he had wormed also went mad, and both ran away (the dog we have already mentioned ran away) but he cannot assert whether they had bitten other animals. He wormed also another when it was a puppy of about four months old. It remained

<sup>a</sup> This controversy was printed in the first edition of this work: to re-publish it now would be superfluous.

<sup>b</sup> Ipswich.

ed well till about three years after, when it went mad, ran away from its master,<sup>c</sup> and bit a great number of other dogs, several of whom went mad soon after.

We shall instance only two other cases in his practice as recent occurrences, and all the circumstances fresh in his mind. A dog that he wormed went mad, and bit several others; two of these had been wormed by him when young: they survived the bite only about three weeks, dying of the malady contracted from the other wormed dog. One of these was the property of a Mr. Mayhew, then residing at Whitton, a village about two miles from Ipswich: the other to a person at Bramford, about four miles distant. The first wormed dog which had contracted the disease, and communicated it by bite to these two, belonged to a baker in this town, named Clubbe. I am thus circumstantial in order to give an opportunity of inquiry to such of this neighbourhood especially, as may still remain unconvinced of the inutility of the practice.

These facts are here established on the surest foundation of accurate observation, and faithful

<sup>c</sup> This happened only three months previous to the time of his giving me this narration,

ful relation. Another person in this neighbourhood informed me of his having a water dog wormed, and notwithstanding which he went mad from the bite of a rabid animal. This is another proof; and certainly the whole are sufficient for the refutation of this long-established absurdity.

I shall not intrude longer on the reader by recounting and refuting other superstitions, which time has not yet altogether eradicated, as they are of less moment. The above were thought most material from the influence they have not only over the conduct of the multitude, but even over the minds of persons more liberally educated.

*Explanation of the Plate.*

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FIG. I.

- A A Part of the tongue of a dog ; the under side turned upwards, to show the *worm* in situ.
- a The worm, as it appears through the cuticle.
- f Its communication with the marginal line of the tongue.

FIG. II.

- B B The tongue dissected
- b The cuticle separated and laid back, to show the muscle wherein the worm lies.
- a a The worm raised from its situation, with its attachment to the muscle.

FIG. III.

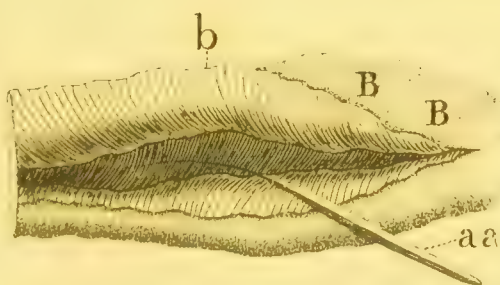
- C The worm taken out.
- c The tendinous part.
- d The ligamentous.
- e The ligamentous running out to a point, but which unites and mixes with the muscular fibres, so as to be lost among them.



*Fig. 1*



*Fig. 2*



*Fig. 3*





## APPENDIX.



*To Dr. R. HAMILTON, Physician, Ipswich.*

DEAR SIR,

YOU do me the honour to request my opinions on the pathology of the Hydrophobia, and I could willingly communicate them to you, had I any to add to those which you must have drawn from your own more extensive reading and thinking on the subject. I had always believed in the doctrine of absorption, as the mode by which this disease is communicated to the nervous system: and as I found nothing in the publication of Dr. Mease to lead me from this opinion, I must of course have made some objections to the  
reason-

reasoning which is contained in his publication.

These I shall proceed to submit to your decision. What Dr. Mease thinks his strongest argument against the absorption of the poison of Hydrophobia, is grounded upon an analogy, which is drawn from an assumed law, which may be proved from daily experience to be no law.

These are his words: " If an actual absorption of virus took place, we should uniformly find that it would stop at the first lymphatic gland, which was situated between the place of absorption and the common receptacle of the thoracic duct, and then cause a swelling and inflammation similar to what is constantly observed to take place in the absorption of the small pox, venereal disease, or pus of any kind.<sup>d</sup> No such appearance however  
has

<sup>d</sup> I am aware that the absorbent vessels must possess nervous energy, and that irritation must be prior to absorption in them; and that therefore the venereal and small pox poisons might be said to be diseases of irritation. But this quotation from Dr. Mease's book plainly proves that he did not mean to be so understood. He only means to deny that the Hydrophobia communicates its poison to the body through the lymphatic absorbent vessels.



has ever been noticed by the writers of the cases on record.”<sup>e</sup>

Now, although lymphatic glands do very frequently enlarge, from the absorption of the small pox, venereal disease, &c. yet there are innumerable instances of each of these diseases passing into the system, without any enlarged gland or stiffness. Indeed there is seldom a practitioner in a large town who cannot recollect cases, both of the venereal disease and small pox poisons having pervaded the habit, without producing either stiffness, or enlargement of the lymphatic glands, nearest the wounds whence these poisons were absorbed.

Dr. Beddoes, in an Appendix to his translation of Gimbernat on the Femoral Hernia, gives two letters from respectable surgeons in this country, who produced the small pox in a variety of patients, without any stiffness or swelling in the neighbouring glands. These proofs alone are a sufficient refutation of the law, and of course of the analogy which is attempted by Dr. Mease to be proved from it.

Dr.

<sup>e</sup> Vide Mease on Hydrophobia, p. 65, 2d edit. Lond.

Dr. Mease supposes that the typhus and hydrophobic poisons act by directly debilitating the system; yet Dr. Beddoes gives an instance, where he himself saw a gentleman exhilarated by the contagion of the typhus fever:<sup>f</sup> and here is in Yarmouth one of the oldest practitioners of this place, who never visits a patient with typhus fever, but he experiences, for some minutes after leaving the room, slight symptoms of intoxication. It is by no means an uncommon remark of the friends of a typhus patient, that they had never seen him in such high spirits as he appeared to be only a few hours before he sickened. Besides the above proofs of the stimulant effects of the contagion of typhus fever, it may be asked, whether a single instance can be adduced of a recovery from typhus fever without some evacuation having been considerably increased.<sup>g</sup>

In

<sup>f</sup> Vide Beddoes on the Catarrh, p. 260.

<sup>g</sup> Though I am of opinion that typhus fever is always produced by stimulus, and of course that the debility is indirect, yet I am ready to admit, where the indirect debility is succeeded by profuse evacuations, that then the disease will be brought to a state of direct debility, and will from that time require only the same moderate doses of medicines, as diseases of original direct debility.

In diseases of direct debility, as from loss of blood, famine, &c. the smallest doses of purgatives, opiates, emetics, &c. are too powerful in their effects. In the Hydrophobia the largest doses of opiates, &c. will scarcely produce any of their accustomed effects; and in the Hydrophobia, as in typhus fever, there are many instances of the remarkable high spirits of the patients for a few days or hours before the commencement of the symptoms of Hydrophobia.<sup>h</sup>

Dr. Mease, to prove the influence of climate on the Hydrophobia, refers to the hear-say fact which is related by Dr. Gray, of a man dying in the East Indies, on the evening of the same day in which he had been bitten. I shall quote the whole of Dr. Gray's account, which is published in the Medical Commentaries.<sup>i</sup>

“ Mr. Murray, who was formerly an officer in the Nabob's service, has just now declared to me, that about three years ago, when at Madras, he saw a man brought into the fort raving mad. He had been bit in the morning  
by

<sup>h</sup> Vide Smith's case, at Acle; also Hogg's case, Med. Comment. D. ii. vol. 10.

<sup>i</sup> Vide D. ii. vol. 2, p. 315.

by a mad dog, and died in the evening of the same day, tearing every thing near him."

Though it is probable that a hot climate may accelerate the symptoms of Hydrophobia, yet surely the manner in which the above fact is recorded is no proof that the man died of an Hydrophobia. Under the abuse of stramonium, bange,<sup>k</sup> moor man's toddy,<sup>l</sup> &c. it is not  
uncom-

<sup>k</sup> Bonge is an opiate made with a species of hemp, &c.

<sup>l</sup> What is called toddy in India, is the juice of the palmira trees, which is obtained in the following manner: Every evening the natives mount these trees, and cut off several of the branches, and fasten to each of these wounded branches large earthen vessels, of the shape of cupping glasses. In the morning early they mount the trees again, and descend with the vessels, which are by that time filled with a fermenting saccharine intoxicating juice, which is by no means unlike, either in taste or effects, to the white champagne of the French, except in being rather sweeter. Each tree will yield several quarts of this drink, which is drank both by the Europeans and natives; and it is a very productive article to the revenue of our India Company.

As this juice, before the influence of the sun on it, is in a state of fermentation, it becomes perfectly acid by noon, and is then sold exceedingly cheap to those who convert it into what is called moor man's toddy, which is made by the addition of chunam (calcined shells) jagara (palmira sugar) and intoxicating vegetable productions. This moor man's drink is a very favourite one with the European private soldiers; and to it some of the most rapid cholera morbuscs and fatal fluxes, may often be assigned.



uncommon to find men in India so frantic, as to wound themselves, or even those who attempt to approach them; and to die in a few hours, from the drunkenness having induced either a cholera morbus, or that sort of tetanic affection, which is commonly called cramp in India.

Under such a state of drunkenness he might provoke some dog to bite him, and might die; but as men in that country frequently die in a few hours, from the spasms brought on by these intoxicating powers, it is still a question, by what proofs the madness of the dog was ascertained; or whether the bite had any share in causing the death of this man. The tetanus, which is excited by a wound, very seldom, if ever, comes on so soon as within twelve hours after the infliction of a wound: and there is not another fact of Hydrophobia to lead us to believe, that this was a case of Hydrophobia.

The other patient with Hydrophobia, whose case Dr. Gray has detailed, did not die till the fifth week from the time the patient was bitten; and therefore rather makes against the influence of climate on this disease.

Although I am very ready to acknowledge the action of the poison of a rabid animal on  
the

the nervous system, and the similarity of Hydrophobia to tetanus, yet I do not see that it necessarily follows, that an Hydrophobia, or even a tetanus itself, when produced from a wound, arises prior to an absorption from the wound.

It is a well known fact to surgeons, that a tetanic affection from a wound very rarely commences for several days after the wound. Are we then to suppose, from the moment the wound was made, which excited the tetanus, that the absorbents in and about the wound have lost their action?

Where the wound has not been kept open by art, is there a well-marked case of Hydrophobia, where the symptoms of the disease commenced prior to the healing of the wound?

Can any wound or ulcer be healed, without the action of the absorbent vessels, which are situated in that wound or ulcer?

Modern physiologists in this country seem to agree, that no healing can take place until the absorbent vessels situated about the wound, are excited to action. Like the theory of Dr. Black on latent heat, you know, that this doctrine of Mr. Hunter upon the healing of wounds, is very generally understood in most  
of

of the medical schools of Europe : and as I think it is very concisely explained by Dr. Darwin and Mr. Adams, I shall transcribe a passage on this subject from each of these writers.

“ When an abscess is formed by a rupture of vessels, the violence of the inflammation ceases, and a new gland separates a matter called pus: at the same time a less degree of inflammation produces new vessels, called vulgarly proud flesh; which if no bandage confine its growth, nor any other circumstance promotes absorption in the wound, would rise to a great height above the usual size of the part. Hence the great art of healing ulcers consists in producing a tendency to absorption in the wound greater than the disposition.”<sup>m</sup>

“ When a division of any solid part on the surface of the body takes place, the most simple operation of nature is to form a kind of scab over it. By this means the whole is defended from the external air; the blood, or other interstitial fluid is absorbed, and the sides unite by contracting closer to each other, or by the apposition of new-formed substances,  
after

<sup>m</sup> Vide Darwin's *Zoonomia*, vol. 1, p. 410.

after which the skin recovering its smoothness, the scab falls off: but the injury may be of such a nature, or the parts may be kept so long divided, as that the edges must die for want of a due circulation. The necessary consequence of this is, that before any other process can commence the dead part must be separated, which can only be effected by the sound part in contact with it being absorbed."<sup>n</sup>

If the wound from the bite of a rabid animal always heals when left to itself, prior to the commencement of the symptoms of Hydrophobia, then before Dr. Mease can establish his position, that this disease is communicated to the system independent of the absorbent vessels, he must first disprove the modern physiology on the healing of wounds. Having taken these liberties with Dr. Mease's publication, which is well entitled to the appellation of ingenious, I cannot conclude without observing, that the second case of Hydrophobia, which is related by Dr. Shadwell,<sup>o</sup> has nothing in it to lead any medical man to believe

<sup>n</sup> Vide Adams on Morbid Poisons, p. 88.

<sup>o</sup> Vide Mem. of Lond. Med. Society, vol. 3; also Appendix to Mease.



lieve that it was a case of true Hydrophobia. The symptoms of the patient, the early period at which these symptoms commenced from the bite, and his recovery, all tend to prove this to have been a case of disordered imagination from fear.

This man bit his mother's head, and he bit several men, but none of them are reported to have suffered from their wounds. The dog that bit him was killed, because he looked gloomy, had bitten other dogs, and was supposed to be mad: but no mention is made that any of these dogs became afterwards mad. The facts of Hydrophobia have taught me to believe we are at present without any other remedy for that disease, but the immediate destruction of the wound.

Under this belief I have meditated upon the maxim, *that a doubtful remedy is to be preferred to none*: and I think it is more justifiable, to attempt a remedy by a dangerous medicine in this disease, than in any other. But the symptoms of Hydrophobia ought unequivocally to be discriminated from the symptoms of the madness from fear, &c. before it can be lawful to hazard the life of a patient to the operation of a dangerous medicine.

As

As the prognosis of an hydrophobic patient with me is death, you must not wonder at the desperate appearance of some of the following queries :

1st. Does the Hydrophobia originate only in the dog kind ?

2nd. If it originates only in this kind, what is the cause of it ?

3d. Is it that he is more subject to stomach complaints than other animals ?

4th. If he is more subject to stomach complaints than other animals, is it because he perspires less than other animals ?

5th. Or from a dog having less perspiration than other animals, does a greater quantity of poison pass off from his lungs, than from those of other animals ; and that therefore his breath, under certain situations<sup>p</sup> and diet, imparts the  
poison

<sup>p</sup> That situations are favourable for the productions of some poisons and not of others, the Island of St. Helena is a striking example. This island is situated in the 16th degree south latitude, many miles from any continent ; is about 21 miles in circumference, and contains near 1000 inhabitants. The small pox has never been seen in this island, but the measles very frequently break out among the inhabitants, at times when they have no opportunities of communicating with strangers : and the inhabitants go so far as to assert, that if any of them visit England,

poison of Hydrophobia to his saliva and teeth?

6th. As felons<sup>a</sup> by nastiness, &c. seem often to have generated poisonous effluvia round their bodies so gradually, as not to have suffered any of the symptoms of jail fever; and yet to be able to communicate this disease to other men, may not a dog, under certain situations and diet, without having ever shewn (or

u per-

land, and receive the small pox, either by inoculation or otherwise, the disease always proves a very mild one with them. In the year 1785 I arrived in that island, where I saw several children labouring under the measles, and received this curious piece of information from the inhabitants, and the surgeon general of the island.

<sup>a</sup> Vide Sir John Pringle's Account of the Fatal Trials at the Old Bailey, in 1750, (p. 291) where the Lord Mayor, an Alderman, and two Judges, and Counsel and Jurymen, amounting to forty, who sat on the left side from the felons, received the infection of fever, and died: while the Recorder and the Lord Chief Justice, and the Jury, who sat on the right side, escaped. The stream of air from the windows directed the effluvia of the felons from the right to the left side of the house; yet it does not appear that any of these felons had laboured under the symptoms of fever. By being gradually habituated to contagion, medical men and nurses often pass through a long life, without having experienced more than very slight symptoms of fever. They may be compared to chewers of opium, who by being gradually accustomed to that stimulus, are able to resist the effects of doses, which would prove fatal in a few hours to many men.

perhaps ever afterwards showing) any of the symptoms of Hydrophobia in himself, be able to communicate the symptoms of Hydrophobia to another dog?

7th. If the painful sensation of the œsophagus or stomach, be universal in Hydrophobia, and the dissections of subjects after death, in this disease, give the signs of local affection, ought not the cure of this disease to be directed entirely to the stomach?

8th. If the tetanic affections of the Hydrophobia are from increased sensibility of the stomach, ought not the cure to be attempted, by destroying this superabundant sensibility of the stomach by such means as have been found to destroy diseased sensibility in other parts?

I should not hesitate to recommend the trial of the Tanjore arsenical pills, which have hitherto neither been attended with any dangerous effects, nor failed in the cure of the poison from venomous serpents, either in brutes or men.\*

With

\* Vide Russell on the serpents of India.



With every wish for the success of your endeavours to illustrate this disease,

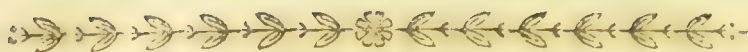
I remain,

Dear Sir,

Your obedient humble servant,

THOMAS GIRDLESTONE.

*Yarmouth, Dec. 23, 1796.*



*To Dr. R. HAMILTON, Physician, Ipswich.*

DEAR SIR,

I Received with no small degree of pleasure the proposals lately sent to me, signifying your intention of publishing soon a second edition of your excellent work on Hydrophobia, and the means of preventing the effects of the poison of rabid animals. Your great experience and intercourse with medical men of eminence, since the appearance of the first edition, must have furnished you with ample opportunities of collecting useful information on this important and highly interesting subject; and must necessarily render the work a valuable acquisition to the public, as well as to the medical practitioner.

Since my residence in this country two cases of Hydrophobia have fallen under my immediate

diat observation. In one of these I saw the origin, progress, and fatal termination of the disease: in the other, the symptoms had made considerable progress before I visited the patient. The most remarkable circumstances attending the former I now send to you; and I presume Mr. Edwards<sup>s</sup> has transmitted to you the particulars of the second.

I should be exceedingly happy, were I justified in encouraging the belief, that they furnished any thing tending to throw light either on the pathology or cure of this most formidable of all human maladies. I fear however they serve only to afford still farther evidence of the futility of our art in combating its destructive ravages. Some particulars however connected with them seem not altogether unworthy of attention.

Both the men were bitten by the same dog, and on the same morning (Oct. 22, 1791), but the effects of the poison discovered themselves at very different periods.

Francis Tweed was taken ill early on the morning of the 11th of Nov. following, twenty  
days

\* Surgeon at Long Melford,

days after the accident, and he lived only thirty hours.<sup>t</sup>

Jeremiah Groves was attacked early on the 27th of Jan. 1792, ninety-six days after the bite; and died on the morning of the 29th, forty-nine hours after the symptoms commenced.

The great disproportion between the periods of attack, and duration of life in these two cases, seems worthy of inquiry.

The influence of peculiarity of constitution on disease, as well as in determining the period of action of certain poisons, and other morbid substances on the living body, is sufficiently known: yet making every allowance for this, in these instances, there seem to be other circumstances, connected with the application of the poison, highly deserving the attention of the medical practitioner.

Francis Tweed received so many lacerated wounds on the throat, neck, and under lip, as to require the aid of suture to bring the irregular and divided surfaces in contact. The parts were, soon after the accident, diligently washed by a skilful surgeon, for a long time,  
with

<sup>t</sup> Vide annexed cases.



with a saturated solution of salt in water; they were afterwards dressed with epispastic ointment, and they healed as readily as common wounds do. Notwithstanding these precautions, the virus shewed its full effect in twenty days, a period considerably within the usual time of its appearance; and the disease terminated sooner than in general happens.

Do not these facts lead to the following conclusions?

That the extensive surface to which the poison was applied, the vascularity of the parts, the lacerated wounds, and their vicinity to the organs more especially affected in Hydrophobia, had considerable influence, not only in accelerating the effects of the virus, but in rendering the disease more violent also. If this be admitted, it suggests an useful caution to the practitioner to apply with the more diligence and attention the means of prevention under similar circumstances.

Jeremiah Groves received only a superficial scratch, so as scarcely to draw blood, on the breast and neck. Ninety-six days elapsed before he began to complain, and he lived forty-nine hours under the disease. Do not these circumstances tend to confirm the inference  
de-

duced in Tweed's case? They seem likewise to favour an opinion that has, I understand, lately been advanced and supported by some, viz. that this, and some other poisons, do not exert their deleterious effects on the constitution in consequence of absorption, but directly on the parts to which they are first applied, and from thence communicated through the medium of the sensible and irritable fibre, to the whole habit, or to particular organs. I have not had the good fortune of perusing any of the publications containing the arguments adduced, with the view of establishing this theory; but the reflections, and attentive consideration of the subject have given rise to induce me to think it liable to fewer objections than that which is generally received, and which you adopted in your former edition.

I presume it is to this doctrine you allude, in speaking of "the difference of opinion on the pathology entertained in Dr. Mease's Inaugural Dissertation, &c."<sup>u</sup> On receiving your letter I commissioned my bookseller to send to town for a copy; but the answer returned him

<sup>u</sup> Address to the public, with proposals for the work.

him was, that it was out of print, and could not be procured.

The effects frequently observed to arise in consequence of a variety of local injuries and irritations, more especially of lacerated, contused, and punctured wounds, are in many particulars analogous to those produced by the virus of rabid animals ; yet it will scarcely be said, that either tetanus, or any of its modifications or varieties, are the consequence of the absorption of any noxious substance, but irritation.

In many diseases we have the clearest evidence of the most violent effects arising, even in distant parts, from local irritations. In many instances of inflammation, especially in whitlows, in many slight wounds, in small punctures, even from needles, pins, or thorns, one or more lymphatics may often be traced in the form of small hard chords, or red lines, running from the affected parts to the neighbouring and distant glands, where pain, swelling, and inflammation, often greater than of the original affection, are produced.

The blood vessels too may often be perceived running, in all directions, a considerable way from the inflamed point : but in either case  
does

this arise from absorbed virus? I presume not. Is it not owing to the irritation applied to the extremities of the vessels propagated along their course to the more distant parts? The blood vessels, more especially their capillary extremities, and the lymphatics, are endowed with a high degree of sensibility and irritability; and from their intimate connection in their whole course with the muscular irritable fibre, by means of minute vessels and nervous filaments, are consequently well adapted to convey irritations to distant parts.

If therefore it be admitted, that we have the clearest demonstration of distant parts suffering violently from irritation alone, is it not more probable, that they do so in every instance, than from absorption of acrid virus, of which we have no positive evidence in any case?

That a considerable quantity of variolous matter is generated on the surface of the body, in consequence of the fever arising from the smallest particle of it applied to any part, is no argument, in my opinion, in favour of absorption; for no proofs have as yet been adduced of its assimilating a certain portion of the fluids to its own nature, as is generally imagined.

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It is much more likely, that as by its irritation it produces general fever, so it also communicates the disposition to the vessels on the surface to this peculiar secretion. The same reasoning applies to the venereal poison, and to various other substances applied to the surface. Moreover, it does not appear that the blood, or other juices are capable of conveying what are called *specific* diseases, which would doubtless be the case if the theory of absorption and assimilation were just. It seems really inconsistent with the laws of the animal œconomy, and more especially those of the vascular system, that a poisonous substance should remain dormant and inactive in the body for weeks, and even months, without inconvenience to any part; yet ultimately shew itself with such destructive fury. It is well known, that from the supply perpetually making from the blood, in the formation of muscle, bone, ligament, and cartilage; and in the various secretions and excretions; and the corresponding addition made to it by the food taken into the stomach, the vital air received into the lungs, and, under certain circumstances, from the absorption by the surface, the circulating mass is perpetually undergoing

ing a change of waste and renovation, so that the blood contained in the vascular system when the accident happened, would soon be completely exhausted : and from experiments and calculations that have been made, this would most likely happen, even within the shortest period the rabid poison exerts its force on the habit. Hence it is reasonable to infer, that any noxious substances entering the circulation must, on the same principle, be thrown out also, unless it be proved, that after being taken up they are again deposited in the parts on which they ultimately produce their effects, where they remain dormant until thrown into action by some exciting cause. But such an idea seems to have neither analogy, nor even probability to entitle it to any countenance. Is it not probable, that if it were absorbed it would shew its effects soon after it came into contact with the muscular fibres of the heart, or those of other parts, as we find is the case on the introduction of a variety of other substances into the circulating mass ?

I not only assent to Mr. J. Hunter's idea of its remaining in the part till within a short period of its action, but that it either never goes beyond it, or if it does, that it is again discharged,

charged, without injury, to any part or organ. When we see the lymphatics taking up with avidity, and often very quickly, great quantities of extravasated blood and serum, even bone itself, or any substances coming in their way, why suppose so long a suspension of their functions with regard to this poison? Were attention to be paid to the parts bitten, it would, I am persuaded, invariably be found, that the first effects of the poison discovered itself in them; that the pain darted not solely in the course of the lymphatics, as the advocates of absorption will have it, but in the direction of the muscular fibre also, to the parts chiefly affected; but from our generally overlooking faint or weak impressions while strong ones are present, these may very readily escape notice. In the two cases which fell under my observation, this was most unequivocally the case; and many authors who have treated of the disease, have mentioned the itching and pain of the parts bitten, having either preceded or accompanied the first attack; and of the wounds which had completely cicatrised, breaking out afresh. If the poison had been taken up into the habit some weeks or months before, surely no vestiges of  
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it would remain in those parts, and consequently no inconvenience would be felt in them more than in any others.

I am aware it may be asked, if it acts by irritation, why, on the same principle, does it not shew its effects immediately?

In answer to this there appears no difficulty in observing, that the analogy in both cases by no means applies; that other irritations do not produce their effects immediately, nor even so soon as this virus in some instances does. Tetanus, or locked jaw, often does not appear for many days after its cause has been applied. In five instances which have fallen under my observation the symptoms did not come on till the tenth, twelfth, and fourteenth day; and they are sometimes protracted considerably beyond that period, cases having occurred, where the wounds had completely healed up before any inconveniences were experienced. In four of these the disease seemed to arise from comprehending a large portion of muscle, and the divided extremity of the large crural nerve in the ligature, in taking up the femoral artery, in amputation of the leg above the knee, according to the old method. In the other, it was after the amputation of a  
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ichirrous tumour from a female breast, for which no reason could be assigned, the operation having been well performed, and every attention paid to the patient afterward. It may appear singular, that in all these, except the last, appearances were extremely favourable, and the pus of a good colour and consistence for several days, which seems, in my opinion, to give force to the arguments advanced in favour of the theory of irritation. Instances perpetually occur of the most violent whitlows and inflammations, and suppurations arising several days, even weeks, after the cause which produced them, probably the prick of a pin, or thorn, had been applied. A case of this kind occurred lately, where the first joint of the index finger became in consequence carious, and cast off.

From what has been advanced, I would by no means be understood to infer, that the rabid poison, and many other substances, as well noxious as salutary, may not be absorbed in the manner commonly imagined. I am perfectly aware of the contrary. I only contend, that when this happens, if they do not shew their effects within a much shorter time than the rabid poison has been known to act, they  
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are, agreeable to the laws of the circulating system, again thrown out of the body, without injury, to any part.

Mercury, and most probably opium, afford examples of this ; for they may produce their effects in either way. The former seems in general to act on the salivary, biliary, and pancreatic secretions, in consequence of being taken up by the lymphatics, or by the lacteals ; yet those cases on record, of salivations having arisen from the smallest quantity of red precipitate applied to a chancre, lead to the presumption of its acting by irritation also. Although opium in general lessens sensibility and irritability, by entering the circulation, yet it seems capable of exerting its anodyne qualities, without being imparted to the blood.

If the analogy of other poisons be allowed to have any weight, it seems to give countenance to this theory, while it militates against that of absorption. The poison of the rattle, and other poisonous snakes ; of the scorpion and centipes ; of the bee, wasp, and hornet ; of the ticunas ; of the nettle, and many other animal and vegetable substances, act, not in consequence of absorption, but immediately on the living irritable fibre ; and the effects  
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of some of them are very quickly propagated to the whole body. I am aware that this is contrary to the inference deduced by that eminent philosopher, and accurate experimentalist, the Abbe Fontana, after sacrificing some thousands of animals in prosecuting his inquiries. But the single experiment of Dr. Girtanner, which was conceived in a truly philosophical spirit, puts the matter beyond all controversy. He found that in frogs, which live a long time without the heart, and after they have been deprived of all their blood, these poisons produced exactly the same effects as before.

It is necessary, say the advocates of absorption, that the variolous and venereal virus should remain for a certain time *on* or *in* the parts to which they are first applied, and there produce *specific* inflammation, and *specific* pus, in order to produce their respective diseases; that it is not the matter immediately introduced, but that formed in the part in consequence of this *specific* inflammation that is absorbed. What a circuitous way of accounting for phænomena for which so ready an explanation seems to present itself! Is it not more natural and consistent with the laws of

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the animal œconomy, more especially of sensation and irritation, to suppose that, like many other substances, a certain time elapses before they produce the local irritation which must necessarily precede the general affection?

That the rabid poison should, in some instances, remain so long inactive in the part seems, at first sight, singular; but when it is considered, that the operation of various substances on the living body, especially the occasional causes of many diseases, are influenced by so many local circumstances; and that scarcely any two substances in nature have a determined period of action, our surprise will, I presume, lessen in a considerable degree. Besides a variety of causes, such as violent exercise, intemperance, excesses of every kind, or any causes tending to excite the action of the heart, or to produce inordinate sensibility or irritability, or the reverse of all these, will have considerable influence in accelerating or retarding its progress. May not the subjects of the cases alluded to be quoted as furnishing examples of this?

If the view in which I have considered the pathology of this disease be founded on sound and rational principles, and will stand the test  
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of farther investigation, it suggests one of the most important practical innovations that has ever been thought of; and it holds forth to the patient sources of consolation which no theory hitherto advanced will admit of. The inference is obvious. If the parts bitten be removed or destroyed at any period prior to the attack of the dreadful symptoms, it appears highly probable these may be entirely prevented; and as no medicine hitherto administered has had the smallest effect, either in mitigating their violence or in checking their ravages, our attention should the more particularly be directed to the means of prevention.

I would therefore most earnestly recommend the destruction of the parts, by means of the liquid caustic alkali,<sup>v</sup> or a strong solution of common caustic in water, in preference to excision or any other means, at any subsequent period after the bite, even after the symptoms of Hydrophobia had commenced. But when this last were the case, I would advise the addition of a deep incision to be made between the parts bitten and those more especially affected,

<sup>v</sup> Aqua kali pur. or lixivium saponarium.

fect, so as effectually to cut off the communication between them. A similar practice, when adopted early, has succeeded in some instances of tetanus; and every thing which gives the most distant probability of success should be tried in the disease in question. Destroying chancres that have appeared several weeks after impure coition, by means of caustic, or removing them with the knife has, in many instances, proved a radical cure; a sufficient proof, that the virus remained in the part, not having entered the habit. The same has succeeded in preventing small pox, when done within the third day, the period at which the progress of the weak irritation seems to commence; or, according to the established theory, when absorption begins; and I trust the same will be found to succeed in obviating the effects of the rabid virus at a much later period than has been imagined.

Should you think these few hints worthy your notice, you may use them at your discretion; and wishing you, dear Sir, every possible success in your present undertaking, believe the sincerity with which I am your's,

L. MACLEAN.

*The*

*The Reader shall be now presented,*

- 1st. With some cases sent me by correspondents, not hitherto published.
- 2nd. A few cases published for the first time in the former edition of this treatise.
- 3rd. Cases collected from various authors, and epitomised, preserving only the most material circumstances.

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### CASE I.

*Communicated by Dr. Maclean, Physician, at Sudbury.*<sup>n</sup>

IN the afternoon of the 27th of Jan. 1792, I was desired by Mr. Clerke, an ingenious surgeon of this town, to visit Jeremiah Groves, a labouring man of the parish of Ballingdon, in Essex, of whom the following account was given me --- That the preceding evening he indulged freely in the use of strong beer, with  
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some of his fellow labourers; that early next morning he went to work as usual, but that complaining of general languor and uneasiness, with soreness and rigidity about the neck, throat, and one side of the face, which he attributed to his last night's debauch, he was obliged to return home early in the forenoon; that he went to a neighbouring alehouse, and called for some beer; that on attempting to drink, the hand seemed to convey the liquor with some reluctance to his mouth; and that he had some difficulty in swallowing. These circumstances, and the recollection of his having been bitten by a mad dog some weeks before (the 22nd of October), led to the apprehension of his labouring under incipient symptoms of Hydrophobia; in consequence of which Mr. Clerke was desired to see him.

I found him in bed, perfectly composed and collected, and, as he said, free from any complaint. The general aspect of his countenance however was far different from that of a person in perfect health. His face was flushed; his skin warmer than natural; his pulse full and 96 in a minute. He was of a strong robust habit, and about 40 years of age. He readily agreed to drink any thing; but  
while



while some liquid was getting ready, though in another apartment, he discovered evident signs of emotion and uneasiness, which increased on the nurse's entering the room with it. He readily took the cup, and fixing his eyes earnestly on it, sighed frequently while he held it in his hand. Some persuasion was necessary before he drank its contents, which he at length did very hastily, and with some degree of pain.

Desirous that every thing possible might be done for his relief in so hopeless a situation, a consultation of all the medical men in the town was deemed advisable. We assembled at six o'clock in the evening.

From the fullest conviction of the inefficacy of all the means commonly resorted to in such cases, I suggested this as a fair case for the trial of a new remedy, and proposed one of which I had been lately informed by yourself,\* and which had been *reported* to you to have been successful in one instance.† This was the oil bath, and the external

\* The author.

† This case was soon after published by Dr. Shadwell, in the *Memoirs of the Medical Society of London*, vol. 3, and is now generally known.

ternal and internal use of oil. My proposal was readily acceded to, and the following plan was determined on, viz. to take 16 ounces of blood immediately from the arm; to rub the external fauces, throat, the side of the neck chiefly affected, and the chest, for half an hour with warm oil, and to repeat the frictions every hour; to give him four ounces of sweet oil every four, and two grains of opium every two hours; to rub six drams of strong mercurial ointment on the insides of the thighs evening and morning, and to immerse him in an oil bath, about blood warm, as soon as it could be got ready. His attendants were rigidly enjoined to keep him as quiet as possible; to exclude the light from his apartments; to let him have his medicine out of a wooden dark-coloured vessel; and bread moistened with liquids, instead of liquids alone. These injunctions were faithfully attended to, except his being kept still and quiet; for a number of persons, prompted by curiosity, crowded into his chamber, and disturbed him much.

We met again at nine o'clock the following morning, and were highly gratified to find the disorder had as yet made but slow progress. He had no sleep, though he took eight  
grains

grains of opium since our visit; but he was in general still and composed, except when he began to dose. He had taken a pint and half of oil, and it seemed to agree well with him. He sighed more frequently, and was sensibly more agitated on the sight of the oil, or any other liquid. More persuasion was necessary before he drank any thing: he swallowed more hastily, and with more pain than before. Solids were swallowed with more ease than liquids. His eyes were somewhat inflamed; but his face was less flushed than the preceding evening. At intervals, when not disturbed, he lay quiet and composed, without much apparent uneasiness. His pulse was 96, and soft, with occasional intermissions. No thirst; tongue clean; body regular; and appearance of the blood natural. No alteration was made in any respect in the plan originally adopted.

My extreme anxiety for the relief of this unfortunate man, and for the success of this new remedy, from which I could not but encourage some expectations, induced me to visit him frequently in the course of the day. Towards the afternoon the progress of the symptoms was too obvious not to be readily discovered. When talked to he was more hurried  
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and agitated ; and he expressed extreme anxiety for the bath. He imbibed an idea he was to be smothered between beds, and in the most earnest manner entreated us not to shorten his sufferings in this manner. He sighed much more frequently, and before he drank any thing there was a quick succession of these. In the evening the sensibility of the mind to all external objects was increased to an inordinate degree. He answered hastily to any questions that were asked him ; and all the motions and actions of the body were performed in the same hurried convulsive manner. Even when left alone, and not talked to, he would frequently start up in, and sometimes jump out of bed. He talked incessantly to his attendants in a manner strongly expressive both of his mental and bodily sufferings. The sighing was now converted into a rapid succession of strong convulsive inspirations and expirations, similar to those observed on going into a very cold bath. He made frequent violent efforts to expel the viscid and ropy saliva, which adhered firmly to the throat and fauces, and which was extremely offensive to him. He had great anxiety about the præcordia, which together with the sighing from the beginning,  
and



and some other symptoms, clearly shewed, that the muscles subservient to respiration, as well as those of deglutition, were in a great degree affected. The subsequent stages of this melancholy case presented nothing that is not found in many others on record. A minute detail of the symptoms therefore is unnecessary. I was surprised to find any uneasiness was perceived on the first attempt to swallow, as this does not happen in general until the muscles of deglutition have been first thrown into action by one or two attempts; but in this my information might have been incorrect.

Every thing was regularly persisted in as before; and though every effort was made, yet it was eleven o'clock at night before the bath was ready. When desired to prepare himself for it, he jumped up immediately out of bed, and hurried to the cask in which the oil was contained. His resolution however seemed to forsake him on the sight of the liquid, and he discovered extreme reluctance, horror, and anxiety on entering the bath, more especially as he sunk in it, and the oil approached his chest and neck. He earnestly entreated us to remove him; and though  
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the most alluring prospects of speedy relief were held out to him, and though I assisted others in forcibly securing him in it, yet he could not be prevailed upon to remain more than five minutes in it. He at length made so violent an exertion as to spring at once out of the cask into the bed, an exertion which in health he could scarcely have been equal to. It might literally be said, that he slipped through our fingers. From this time to the period of his dissolution, at five o'clock the following morning, he enjoyed not the smallest lucid interval.

The melancholy and truly distressing picture the last stages of this case exhibited to our view, was such as language is insufficient to convey a just idea of; but such as must ever remain deeply impressed on the minds of those who witnessed it. He was sensible to the last. He had none of the involuntary discharges that sometimes occur in this disorder.

It may not be improper to observe, that for several days after attending this man, I had a most distressing oppression about the præcordia, which caused frequent sighing, similar to that with which he was affected; and my nights were extremely restless and disturbed.

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This case adds one to the many similar instances on record, of persons falling sacrifices to their credulity, by misplaced confidence in boasted specifics: for this poor man instead of applying to a surgeon, went to a farmer at some distance, and used for some time one of these secret remedies; and so convinced was he of its specific powers, that when I asked him some questions about the bite, he said, "he was sure his complaint could not be from that, as he had been already cured." Nothing had been done to the wounded parts, which were very superficial, and might easily have been removed or destroyed, and this man's life, beyond a doubt, saved. That valuable lives should thus be sacrificed is an evil of the first magnitude; and it is earnestly to be wished, this may attract the attention its importance demands. Accidents of this description soon circulate in the neighbourhood where they happen, and instead of suffering such as may unfortunately be bitten to be lulled into fatal security by the promises of impostors, if the magistrates, or the gentlemen and clergy to interpose their friendly advice, by taking care that the proper means of prevention, on which only any reliance is to be placed, were  
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practised under the direction of one or more respectable surgeons, a calamity the most formidable in its aspect, and fatal in its consequences, to which the human race is liable, might, I am fully persuaded, in every instance, be prevented. On occasions of this kind every medical man of humanity would cheerfully lend his assistance; but unless applied to, his voluntary interference might be construed by the lower classes into interested views.

It may be said, that this case affords an instance of the unsuccessful exhibition of oil; that little reliance is to be placed on it; that Hydrophobia still continues to be, as it has hitherto been, the *opprobrium medicorum*. I own I had formed high expectations from it, and my disappointment on its failure was the greater; yet it is but justice to Dr. Shadwell to declare, that the fatal termination of our patient's case seems by no means to justify the above inference. It could scarcely be said to have a fair trial. Opium and mercury were administered at the same time, which we are certain have failed as often as they have been used. I apprehended they have done more; that they have been productive of mischief also. When opium is given in very large doses,



doses, and neither procures sleep, nor relieves pain, it generally disorders the habit in a great degree, producing head-ach, delirium, fever, and sometimes convulsions. Mercury in large quantities unless it relieves, generally aggravates the evil it is intended to remove. In the present instance I could not help thinking it did harm. We ought to have trusted solely to the oil. Other circumstances too contributed to defeat our views. The number of persons constantly admitted into the patient's room, and the noise kept up about the house, disturbed him exceedingly. The bath was used at a time when no relief could be looked for from any remedy.

If a case of Hydrophobia ever fell under my care again, I should trust entirely to the internal use of oil, and the oily frictions (the bath being liable to numberless objections), and I would advise them at longer intervals, of four hours at least, it being of the greatest consequence to keep the patient quiet, in order, if possible, to procure sleep.

## CASE

## CASE II.

*Communicated by Dr. Maclean.*

TWO boys (brothers) were bitten at Colne, in Essex, about nine miles distant from Sudbury, at eight o'clock the same morning, doubtless by the same, a large black Newfoundland dog. One of the boys (Middleton) aged 14, was bitten in the under lip, completely through, and received several superficial scratches in the face. About eleven o'clock the same day, Mr. Raynbird, surgeon at Colne, who favoured me with this account, saw him. The wounds were well washed with cold water, and dressed as common wounds. The same evening he began to take the Ormskirk medicine; and afterwards took a nostrum recommended by a farrier; and he has remained in perfect health since that period.

The other brother aged 12, was bitten in the hand, and the wound was treated in the same manner. He took the Ormskirk medicine, but not the farrier's nostrum. He was taken ill on the morning of the third of November  
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following, twelve days after the accident. Mr. Raynbird saw him at noon. He was bled and ordered the Tonquin medicine. He died on the sixth; consequently the farrier had the credit of the cure in the other case.



*Farther Particulars of the same Case, communicated by Mr. Raynbird to the Author at his Request.*

“ I find, by referring back to my book, that he received the bite on the 22nd of October, and the first appearance of the disease was on the 3rd of November. I do not recollect that he complained of any particular pain in the wound, which was large and deep, in the fleshy part of the hand, and very little disposed to heal at the commencement of the disorder. On visiting him the second day of his illness, I found him sitting by the fire; and on opening the door at my entrance, he screamed out most violently. Apprehending the cause, (viz. that the cold air affected him) I shut it as quick as possible; upon doing so he became quite calm. During the paroxysms his eyes looked very wild, but when that was over I observed

nothing particular in them. The last two or three days he vomited up a great deal of slimy mucus. The first three or four days his tongue was white and moist; the latter part of the time it turned brown and dry. Great difficulty in swallowing continued the whole time.

“ I gave him immediately the Tonquin medicine, with musk, &c. but found no mitigation of the symptoms from it. He lived to the 8th of November, when death put an end to his sufferings.”

### CASE III.

*Communicated by Dr. Maclean.*

Several others were bitten by the same dog, near Kelvedon and Coggeshall in Essex, and died in consequence. Mr. Godfrey, surgeon at the latter place, writes to me, saying, he attended two girls about nine or ten years of age. One was bitten in the cheek, and was taken ill the end of the third week: the other was attacked between a month and five weeks from the bite; and they both died about the end of the fourth day, perfectly sensible to the last,



last, but strongly convulsed. The girl bitten in the cheek was exceedingly distressed at feeling the slightest stream of cold air, or when exposed to light. Mr. Godfrey did not see them till a considerable time after the accident; and the common means were had recourse to.

At the time these and several similar accidents occurred in different parts of Suffolk and Essex, I took every possible pains to suggest such methods as appeared most likely to avert so dreadful a calamity, especially as even the common means had been neglected, in some instances, where lives might otherwise have been saved. After mature consideration the *liquid caustic alkali* presented itself to me as a substance liable to none of the objections urged against the hot iron, common caustic, and even the knife itself. It's well known property of dissolving mucus, and all animal substances, as soon as it comes in contact with them, gives it the preference. Besides, the superior advantage a liquid possesses over a solid substance of equal activity, by more readily pervading all irregular lacerated surfaces, and deep punctures, and by leaving no eschar behind,

hind, which might exclude farther applications, left me no room for doubt.<sup>z</sup>

When wounds are inflicted about the tendinous parts of the hands and feet ; about the throat, neck, and lips ; in or near large nerves or blood-vessels, the knife cannot be used with safety ; whereas this substance may be applied without the smallest hazard. We can carry it as far as we please, and stop its progress in an instant by dilution with water. It is the basis of all injections for preventing venereal infection, from the peculiar property it possesses of washing off, and dissolving mucus. In addition to the destruction of the parts to some distance beyond the wound with the pure undiluted alkali, the neighbouring parts, and indeed the wound itself, should be well washed with a diluted solution, poured from a considerable height.

Mr. J. Hunter recommended quick-lime, which approaches near to it ; but surely this  
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<sup>z</sup> This has been recommended by Roux of Dijon, near 20 years ago (vide Mem. de la Soc. Roy. de Medicine, ann. 1783), and Mr. Simmons (vide Ferriar's Histories and Reflections, vol. 3, p. 220) has used it 20 years in the Manchester Infirmary. These three gentlemen seem to lay equal claim to the discovery, as it would appear they had no communication with each other. R. H.

substance ought, for obvious reasons, to have the preference. By the use of this alone, and by pouring water from a considerable height, so as to fall with great force on the part for a long time, and repeated often, I doubt not but every particle of the poison may be either washed off, or effectually destroyed; and that the disease may thus be prevented in every instance.

*Sudbury, Aug. 26, 1796.*

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#### CASE IV.

*Communicated<sup>a</sup> by Mr. Edwards, Surgeon, at  
Long Melford.*

F. Tweed, a labouring man of this parish, aged 55, going to his work about four o'clock in the morning of Saturday Oct. 22, 1791, was violently attacked by a large black or dark-coloured dog.<sup>b</sup> He had a large wound on the throat, which laid the trachea quite bare a considerable extent, and which likewise appeared

<sup>a</sup> Almost immediately after the patient's decease.

<sup>b</sup> The same that bit the patients in the preceding cases.

peared to be considerably bruised. One on the cheek, which enlarged the mouth a full inch; a smaller one lower on the chin, and another lower than the former one on the throat, which evidently proved the animal had shifted his hold. As the wounds were so large and complicated, it was impossible to extirpate the parts. I therefore immediately washed them with a solution of salt, vinegar, and water: then contracted them by future, without which the face was terribly disfigured, with a view to prevent absorption. I dressed with ung. cantharid. a few days; then ordered emollient cataplasms, and permitted the wounds to heal.

The Ormskirk medicine was administered immediately after the accident happened; and as no certain intelligence could be obtained of the dog, we flattered ourselves with the hope of its being some furious animal of our own neighbourhood, not mad, and consequently the danger over. In about a week the poor fellow resumed his usual employment, and continued in good health till Thursday the 10th of Nov. when he complained to his master of little tingling, or pricking pains about the throat, but which he attributed to  
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a little cold caught in the so-recently healed lacerations. The next day, Friday the 11th, he went to work at his usual time, after having passed a restless and uncomfortable night; but about ten o'clock was taken faint and giddy, and obliged to leave his work. He then went into the farm-house kitchen to breakfast, and first perceived a difficulty in swallowing his bread; but on attempting to drink he started from the fluid with great horror. He was immediately ordered home, and walked half a mile or more with great composure. Being informed of his illness, and suspecting the cause, I visited him directly. I believe he had no suspicion at the time of his disorder arising from the late accident. I offered him a little brandy in a cup, but he could not look on it without the greatest distress. Anxiously wishing to do any thing in my power for the poor man, in this dreadful calamity, I requested the assistance of Dr. Maclean of Sudbury: Mr. Bolton, surgeon of this place, likewise gave his advice and assistance. He suggested vinegar as being successful in a case of Hydrophobia on the continent.

: This is the case Dr. Maclean alludes to, p. 293.

ment. Being all apprehensive that little was to be done, we agreed to make the experiment, and jointly observe its effects. His pulse was small and thread-like, intermitting frequently and irregularly, perhaps about every 12th, 10th, 7th, and often every second or third stroke. His tongue was dry, and thirst very considerable. Vinegar to the quantity of half a pint was got down about noon, and very soon repeated a second and third time. It produced a plentiful evacuation from the bowels, and considerable perspiration. Three grains of opium, and two of merc. emet. flav. in a pill was given every four hours. The vinegar plan was still continued, with a little gruel and brandy intermediately. Laud. liquid. to the amount of 200 drops, were got down in the vinegar or gruel, in the course of the day and night, with some little abatement of the spasmodic agitations. Vomiting from the beginning was very inconsiderable.<sup>d</sup> Swallowing

<sup>d</sup> Respecting this symptom, which is observed to take place in many, though not in every case, Dr. Maclean is inclined to attribute it to an irritation about the fauces and pharynx, and the muscles concerned in deglutition. This may arise, in his opinion, from the viscid mucus adhering to these parts, causing the "contents of the stomach

lowing, I thought, was performed with more ease. The pulse much as before described. Unremitting vigilance and attention was given to the vinegar plan, so that in the whole we got down four or five pints. During the progress of this very dreadful disorder there never was any thing like delirium, but a steady clearness and perfect recollection. Nor was there any thirst complained of after the use of vinegar. I observed the pupil of the eye was greatly contracted; but white objects, which at first gave him uneasiness, did not continue to do so; nor was he afraid of looking in a glass. He made no urine the first day, but on the following morning that evacuation was considerable.

Saturday the 12th, a case was mentioned, which happened at Wrexham in Wales, where oil had been used with success in this disease. Ready to adopt any thing that afforded a ray  
of

mach to be evacuated without any sickness." The medicines exhibited may assist in producing this action.— "This seemed to be the case," says Dr. Maclean, "with Francis Tweed; for I have the most perfect recollection of his vomiting considerable quantities of yellow bilious matter during my first visit; but this I attributed to the quantities of vinegar that were forcibly poured down his throat." Letter to Dr. H.

of hope, we gave him from three to four ounces of ol. olivar. This was got down with as little difficulty as any other liquid ; but he expired almost instantly after it, although a few minutes before he appeared likely to have lasted considerably longer. The whole time of his illness, from the first appearance of Hydrophobia, did not exceed thirty hours.

*Quere.* Is it not probable (as he was held down during the exhibition of fluids) that some of the oil might regurgitate, and from the mouth slip into the trachea, and kill by instant suffocation?

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### CASE V.

*Communicated by Mr. Freeman, Jun. Surgeon,  
at Stowmarket.*

It happened in the Autumn of 1790.

Steward Race, aged 40, a pauper, belonging to the Hundred of Stow, was bitten by a mad dog on the face. Next day he took  
a fa-

To this patient I was called ; but a second messenger speedily following the first, with the news of his death, prevented my journey. R. H.



a famous specific; vended by a Mr. Pizey, of Bury St. Edmund's. His lip was cut through by the dog's teeth. From the unfavourable situation of the wound no attempts towards excision were made. On Thursday morning it was dressed; and on Thursday, exactly six weeks from thence, he was attacked with the disease. On the preceding evening he complained of a very severe *cold*, as he said, attended with shivering, uneasiness, and yawning. This morning (Thursday) went out, but could not bear the *wind to blow* on him; and he walked *backwards* to prevent the uneasy sensation it gave him. Attempting this afternoon to drink beer, he found he could not swallow; yet he ate some peas broth very heartily. About six ounces of blood were taken from him; and this night he took Tissot's bolus, which we are told was composed of ten grains of each of the following articles, viz. rad. serpentar. virgin. aff. foetid. and camphor, with a grain of opium.

Friday---no rest from the bolus; appeared very *sad* and dejected; passed a good stool; pulse regular; gave him Cobb's powder, which he took every three hours in roasted apple: he kept them down but a short time, for he  
had

had now a constant vomiting: complained greatly of a difficulty of breathing. This night his sleep was restless and confused, with frequent fits of delirium and raving. The bitten parts were inflamed, as should have been observed: he had a swelling also on one side of his face, which extended down to his throat. He could not now bear either the sight of water, or any thing liquid.

Saturday morning at six o'clock, was in such horror and delirium, that his attendants were obliged to tie him down in bed, though he did not attempt to commit any violence on them. When the fit was over he requested them to tie down his legs (so sensible and rational was he) lest he should do them harm. Saw him about ten: he conceived now they came to smother him, and was much frightened: oppression across the præcordia was increased; he spat immoderately; was continually talking about his malady, and sometimes very rationally: was bled a second time to the same quantity as before; it relieved somewhat his breathing: a clyster was injected, as his bowels were uneasy. Sometimes he would lie down on the bed apparently easy for the space of half a minute, and then jump up in the greatest horror

horror imaginable. One circumstance was curious; he now called for water to wash his hands: it was given him; he rose up in the bed, shut his eyes, and with the greatest resolution, though with the utmost horror, accomplished it. By his own request also he took a powder in water: vomited it up soon after: swallowed now very indifferently: about three P. M. called for something to drink; but expired before his attendants could fulfil his last request.

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## CASE VI.

*By Mr. Thompson, Surgeon, at Acle, in a Letter to Dr. Girdleston, Physician, Yarmouth, Sep. 23, 1796; and by him communicated to the Author, with Remarks.*

DEAR SIR,

On the 2nd of April, 1796, Samuel Smith, about the 18th year of his age, was bitten just above the outer arch of the left eye-brow, by his master's dog, who was of the Newfoundland breed. The dog had discovered no symptoms of illness, and at the time of biting he did  
not

not appear angry, but in his usual playful mood. The wound seemed merely a scratch. It bled, and the lad applied to it some flax from his hat. The next day the dog was missing. The singularity of this circumstance excited the fears of the lad, who was then advised by his neighbours to place himself under the care of a man of the name of Cutting, who pretends to have the power of preventing attacks of Hydrophobia, or even of curing it, after the symptoms of that disease have fairly commenced.

Cutting gave the lad his medicine; and that evening, by the desire of his master, the lad applied to me. I removed the bitten part, and cauterised it with the lunar caustic. The next morning I bled him, and wrote to you concerning his future plan of treatment. But as Cutting possessed his confidence, and popular opinion was in favour of Cutting, he had ceased to be my patient, and I am unable to say how long the wound was kept open. I rather think it was soon healed, as Cutting had disapproved of every thing I had done. The lad, after taking nine doses of Cutting's antidote, was declared by him to be exempt from danger.

On



On Monday the 16th of May, he was in many different places after his master's business, and though usually a sober lad, he that day had drank freely. In the evening he went to a camping match, was intoxicated, and staid out all night. On Tuesday and Wednesday he was very much indisposed; but he attributed his indisposition to his preceding intemperance. On Thursday morning about five o'clock, I was called up to him, and found him labouring under the usual symptoms of Hydrophobia, and complaining of a burning pain at the pit of the stomach. I took away twelve ounces of blood from him, and gave him the following bolus in a little conserve of hips: tartaris. antim. one grain; calomel pp and camphor, each four grains. This bolus produced three or four motions; and as he had had no sleep, and appeared dreadfully agitated, he took 60 drops of laudanum; and at the expiration of one hour 70 more. He then slept soundly for an hour and a half, but did not appear to be relieved by the sleep. As the symptoms were all increasing, he then began upon Fowler's drops, in twelve drop doses, as you had recommended. I staid with him all Thursday night, and on Friday you saw

saw him. His state at that time is doubtless fresh in your memory; and about six o'clock that evening he expired.

It may be proper to observe, that he possessed great resolution, was sensible of his dangerous state, complied with every request, and retained his senses till his death. A stream of air increased his agitation; and the blood, at its first effusion from his arm, wonderfully affected him. His countenance, at different times, strikingly marked every passion; and every action was expressed with morbid quickness.

The above, my dear Sir, is a pretty accurate statement of the poor lad's case.

Your's respectfully,

H. D. THOMPSON.

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### *REMARKS.*

To the above statement by Mr. Thompson I have only to add, that the lad had no priapism; nor would he acknowledge to have any increased sensibility about the œsophagus; but  
referred

referred all his painful sensations to the pit of his stomach. A stream of air from the window, or the sight of any liquid at the distance of some yards, wonderfully increased his agitation. The part where the wound had been given was without pain, and the scar was scarcely visible.

Immediately on seeing him I gave him a large cup of olive oil. He had much increase of convulsive action on endeavouring to swallow the oil; but after getting it to his mouth he swallowed it very hastily. The cooling and pleasant sensations which the oil at first produced gave him great hopes, and he was able to swallow three cups of oil with much less difficulty. In about half an hour he had drank near twelve ounces of oil; but from that time the oil ceased to alleviate any of the painful sensations, which kept increasing until six o'clock in the evening, when he died. As Mr. Thompson, after sitting up all night, was attacked with an erysipelatous inflammation of the head and face, no dissection was made of the body.

The singularity of his case seems to me to be, that the dog had accompanied the lad for six preceding days upon a journey, with his

usual *sprightfulness*; and that, by the testimony of the whole family, the bite appeared to be given accidentally in a fit of *play*, which the dog was in the habit of having *provoked* from him, not only from the unfortunate lad, but even by the children of the family. From such a fact one would be inclined to say, that no bite from any dog ought in future to be received without the wound undergoing an immediate excision.

When Mr. Thompson wrote to me to know what I would recommend, if the symptoms of Hydrophobia should appear, my answer was, that as all the common medicines had failed, I would advise the trial of arsenic, in such doses as could be given with safety: but as Mr. Thompson had no preparation of arsenic by him when the symptoms of Hydrophobia commenced, no conclusion can be drawn from the three doses of Fowler's drops which were given to Smith; since they were neither sufficiently strong to excite any new action in the habit, nor given until the hydrophobic action had nearly killed the patient.

My reasons for the trial of that mineral in this disease were, because the bites of the *co-bras*



*bras de Capello*,<sup>f</sup> and *cobras de Manillo*,<sup>g</sup> serpents, in the East Indies, are always fatal in a few hours, excepting in those bites of them where the Malabar antidote had been almost immediately administered: and although the composition is made up by the Bramins, and kept a secret, and is very rarely allowed to be given by any other hands but their own to the patient, yet the Europeans in that country have discovered, that arsenic forms the principal part of these pills. They almost immediately after being swallowed excite a most violent vomiting and purging, which continue for several hours. Until it was known that these pills contained arsenic, the ophiorhiza root was supposed to be the principal ingredient of them; because the ichneumon,<sup>h</sup> when bitten in his battles with these serpents, is said to cure himself by some of that plant.

THOMAS GIRDLESTONE.

|                             |                         |
|-----------------------------|-------------------------|
| <sup>f</sup> Coluber nija   | } I believe of Linnæus. |
| <sup>g</sup> Coluber bactan |                         |
| <sup>h</sup> Viverra mungo  |                         |

CASE

## CASE VII.

*Dr. White's first Communication to the Author.*

DEAR SIR,

In compliance with your request, and with a desire to add my mite to your laudable work, I have sent you a few particulars of the four cases which it has been my misfortune to be called to in the course of my practice.

The first was that of a husbandman, aged about 35, to whom I was sent for on the third day from the Hydrophobia, and about the fourth week from his being bitten by a cat on the wrist; which animal he instantly destroyed, without entertaining the least idea of its being mad. The most remarkable circumstances in this man's case, as the surgeon who attended informed me, were alternate depression and phrenzy, for the two first days of the hydrophobous symptom, and the sense of cold and rigor, previous to the latter paroxysm.

He had been bled rather copiously early in the morning, after which it was observed to me, that he had continued at least six hours in a more quiet but dejected state. This inter-  
any

val was not less than four hours longer than any one previous to it, and had induced the attendants to remit his confinement. At length, being suddenly seized with suffocating stricture in the throat and chest, he broke loose and ran furiously into an outhouse, the door of which his affrighted pursuers fastened on the outside. I reached the house in time only to be an eye-witness of his loss of strength from several wild attempts he made to climb the wall, and of the convulsive struggles which soon put an end to his existence. He had been continually hawking up saliva, and the offer of liquids caused great agitation. There was afterwards sufficient authority to conclude that the cat was mad.

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### CASE VIII.

#### *Dr. White's second Communication.*

A middle aged man had been bitten on the hand by a dog which, from various circumstances, was proved to be mad. The apothecary who attended had recommended Dr. Mead's *pulvis antilyssus*: he took it four mornings successively, and afterwards bathed regularly

larly in the sea every morning, for near a month. He then grew dejected, and complained of pain shooting from the part bitten up the elbow repeatedly, together with slight uneasiness in swallowing his saliva. His terror increasing, I was sent for on the following morning; at which time he felt much stricture in his throat, more particularly on each attempt to swallow liquids; also a heavy dull weight at the sternum, which he said *dragged down his wind-pipe*. I ordered *musk*, *camphor*, and *opium* made into a large bolus, with *conf. rutæ*, to be taken every four hours. A liquid epithem with *tinct. thebaic.* to be applied to the throat and the semicupium, which was repeated at night. Partial sweat was promoted by it, but of the faint clammy kind, with frequent flushings on the face and neck; the symptom of painful deglutition still increasing. On the next morning, which was the third of the symptoms, the saliva was thrown off with great difficulty: his mind was much agitated, and he refused with vehemence every thing that was offered to him. Debility rapidly increased, and he died in convulsion the morning of the following day, which was the 34th from the bite.

The



The wound was studiously kept open with caustic and escharotics. The stomach did not appear to be affected with either nausea or pain; but the abdominal region was constantly in a state of spasmodic constriction, although an oily enema had been repeatedly given.



### CASE IX.

#### *Dr. White's third Communication.*

In this unfortunate case I was consulted on the sixth day from the accident. It was the bite of a mad dog on the calf of the leg of a healthy lad, who was about 14 years of age. He had taken the Calthorpe medicine, with *theriac. venet. &c.* from the second day, and on account of the confidence reposed by the relatives in the report of the advisers, it was continued to the tenth morning, according to the terms ordered in the recipe. This did not prevent my endeavour to throw into the habit *ung. merc. fort.* (a remedy at that time strongly recommended) in sufficient quantity to raise a spitting, which came on in a gentle manner on the sixth day of using it, and was continued,

in

in a moderate degree, up to the first symptoms of constriction in the throat, and a slight pain diverging from the wound; these came on about the 26th day from the bite. I then ordered a bolus with *camphor*, *castor*, and *opium*, to be given every fourth or sixth hour, agreeably to its visible effects: the *opiate epithem* to the throat, and his feet and legs to be repeatedly fomented or immersed in warm water, the steam of which, on attempting the latter process, excited strangulation to an alarming degree: it was therefore prohibited. He took four of the bolusses on that day and night, but with no good effect. On the following morning I found, that the nervous startings, and constriction in the throat and chest were increased, that his pulse was quick and weak, his urine and stool passed involuntarily, his eyes had a vacant stare and a diaphanous appearance, and that his breathing was very short. Nothing further was attempted, and he died the next morning, being the 29th from the bite,

CASE

## CASE X.

*Dr. White's fourth Communication.*

A labourer, aged about 30 years, meeting with a little dog which he knew, in full run on the road, caught it in his arms, and was bitten by it in the cheek, by which the animal freed itself, and ran off. The poor man hearing soon afterwards, by chance, that it was mad, became extremely unhappy, yet kept the accident a secret from every one but his father, from whom he obtained a solemn promise not to disclose the matter to any one, entreating him at the same time to purchase for him a box of pills, which, like every other prophylactic medicine in such cases, had acquired false repute. About a month from the bite he complained of some difficulty in swallowing, and a disagreeable fulness on that side of the face, which symptoms were so far increased on the following morning as to occasion much alarm, and add greatly to the horrors to which he had been all along subject; and the father, with some difficulty, prevailed upon him to send for medical assistance. Nothing particular

lar was discovered in the throat, except that the fauces were in a state of relaxation. An astringent gargle was therefore ordered by the surgeon who attended, and an opiate pill to be taken at bed time. He could not be persuaded to go to bed; but now and then, as he sat in his chair, fell into short slumbers, attended with muscular twitchings and irregular respiration. Early the next morning the surgeon's attendance was again required, who strictly examined the fauces, but perceived no change for the worse; yet was rather surprised at the dejected appearance of the countenance, and the catchings in his breath; also at the painful sensation in the chest and præcordia, which the patient complained of. He therefore recommended that I should be sent for. We met soon after, and found the poor fellow sitting in a dark corner of the room, with a settled melancholy in his countenance, and frequently hawking up, and at the same moment spitting out the saliva. I saw no visible sign of disease in the throat; but whilst I was examining his throat and fauces a second time, he complained that the room was close, and he wanted air, and begged to have the window opened; at which time it rained heavily, and the



the moisture of the external air rushed upon him so suddenly, that he started from the chair, and hastily cried out *I shall be choaked.*

This convulsive constriction, which was similar in appearance to the sensation and effect that water has on some persons at first bathing, immediately struck me with the idea of Hydrophobia, and to render it more certain I called for a glass water, and offered it to him to drink; but he refused it peremptorily. I then went out of the room for a short time, and took the opportunity of questioning the father, so pointedly at last, that he with tears confessed the truth, as before related. We then returned together into the room where the son was, who with a melancholy and affecting tone of voice immediately called out *Oh! father, father, you've betrayed me!* Pretending ignorance of what he meant, I told him that his complaints arose from a slight cold, but could be soon removed, if he would take a pill I should order him, and go to bed: that word had so strong an effect on his mind, that he called out in the greatest distress, *No, no, then you'll smother me.* In a state of despondency, and with agonizing groans, he threw himself down, as we thought, in a corner of  
the

the room, and soon after crawled about in a restless manner, dragging his legs after him, which proved to us, that he fell on the floor from his lower limbs being palsied. In proportion to his loss of strength he became more composed and resigned to his fate, shaking hands with several of his friends about him, and desiring them not to be afraid, for he should not hurt them. Whilst he was performing this act of friendship with his fellow labourer, his mind became strongly agitated, a general convulsion seized his whole frame, and closed this melancholy scene.

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In reference to the foregoing cases I have to inform you, that the history of the first, prior to my arrival, was given me by the farmer, in whose employ the poor man had long earned his bread. The narrative of the second case I obtained from the apothecary, who lived near to, and anxiously attended upon the patient. The third case is drawn from notes generally taken. With regard to the fourth case, I ought to apologise for so tedious a detail of particulars foreign to your purpose; but

but the horrid circumstances attending it had made so strong an impression on my mind, that I found it impossible to disjoin them. I do not recollect either hearing of, or seeing any symptoms of vomiting in the foregoing instances; and must beg leave further to remark, that whenever either of the two cases to which I was called in time to make the trial, has recurred to my memory, it has been a subject of regret with me, that the idea of extirpation and ablution, even at an early period of the hydrophobous symptoms, did not present itself.

I am, dear Doctor,

Your's most sincerely,

Bury St. Edmund's,

R. WHITE.

April 4, 1797.

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*Letter from Mr. John Hunter to the Author, in
Answer to some Queries.---Republished from
first Edition.*

DEAR SIR,

I received the favour of your's. I am always extremely happy when I can give any useful information; but all the information I
can

can give you relative to the Hydrophobia is rather negative good than positive. All the means recommended were used in Master Rowley's case. I saw him only a few hours after the bite. The lip was torn a good deal. The teeth had gone through and through, and had torn out a piece. I immediately applied the caustic to every surface that I conceived had been made by the dog's teeth; and when those sloughs came away, I went over the same field a second time; but from the termination of the whole, I am inclinable to believe that I did not touch every part where the teeth had been. He took the Ormskirk medicine by the direction of Mr. Barry, who sells it, therefore we must suppose it was properly given. He also took the Tonquin medicine, viz. musk, cinnabar, &c. as also rubbed in mercurial ointment till his mouth was sore. My whole dependence was on the caustic, but did not object to the others being given. I wish I could say more on the subject in general. We seem to be as much at a loss how to treat it as they were a thousand years ago. I have not yet heard of the particulars of Master R.'s attack and symptoms. I want very much to learn them. To ascertain a mode of cure
will

will be very difficult : for a few cases not having the symptoms, under any course, prove but little. I know where there were twenty-one people bit by one dog : nothing was done for any of them, and only one was taken ill. If they had all taken medicines, then it would have been said, that they only lost one out of twenty-one.

I am, dear Sir,

Your most obedient servant.

JOHN HUNTER.

London, March 3, 1785.

CASE XI.

*Communicated by Mr. Tufon, Surgeon, at
Boxford---republished from first Edition.*

I was informed that Master Rowley, the subject of this case, was on a visit in Jermyn-street, the 6th of Dec. 1784, where a stray dog came into the room. The lady of the house taking notice of its being very thin and poor, ordered a plate of meat to be set before it,
which

which the dog eat. The young gentleman took particular notice of it, and stooping down to examine it, the animal turned from its meat, and bit him on the right side of the lower lip. He was immediately sent in a coach, which was then ready at the door, to Mr. Hunter's, in Leicester-fields, being at the distance of about a quarter of a mile, who very wisely and cautiously treated it as supposing the dog mad, by applying a caustic to the part in such manner, as to endeavour to destroy all the adjacent absorbing vessels from taking up any of the venom. Immediately on which Dr. Turton was consulted. The Ormskirk medicine was given, and mercurial ointment rubbed into the legs twice a day: the musk medicine was likewise given.

I found by Dr. Turton's account, they were alarmed at the feel of the skin, and some other dangerous symptoms, when in town, before the musk medicine was given. They continued the Tonquin medicine and ointment till he came into the country, which was on the 24th of December, where he arrived in perfect health. I saw him on the 25th, with his lip healed, which was kept open till nearly the time he came down. I received
 direc-

directions from Dr. Turton and Mr. Hunter as follows: "That the general health must be more particularly attended to, the state of the bowels, the pulse, &c. must be watched." Before he began the musk medicines the pulse was low and feeble, the feel of the skin cold and clammy, though he made no complaints. The feel of the skin and pulse are now (25th) much better, and he appears to have no complaints---bowels in their natural state. Mr. Hunter thinks the wound in the lip may be permitted to heal, and that any little softening application, such as suet, oil, fresh butter, &c. and preserving it from the air, is all that may be necessary. "We wish however not to omit any thing that may be necessary to prevent mischief, and could wish the musk medicine and mercurial ointment to be continued, under the direction of those who attend. Half a dram of the strong mercurial ointment may be rubbed in twice a day, but the gums and mouth must be watched, as we do not wish to bring on a salivation, though we could wish to fill the constitution pretty full of mercury. Under this idea it must be continued or discontinued, from time to time, for three weeks to come.

“We should advise also the use of the following prescription, according to the circumstances of the pulse and feel of the skin, and *general state of the health*, which we beg to repeat, as we consider it as the most material.”

Two scruples of the strong mercurial ointment were rubbed in for two or three days; but as the weather has been so severe, half a dram only hath been used twice a day, and that discontinued for two or three days. The musk medicine, as ordered, was musk six grains; nat. & fact. cinnab. each eight grains; to be given in a bolus every eight hours. The dose of musk and cinnabar may be varied according to circumstances, but should be continued, at times, for three weeks to come.

I was, on inquiry, informed the dog was secured, and died before the young gentleman left town; therefore I observed a strict attention to the method adopted of giving the musk medicine, and rubbing in half a dram of the strong mercurial ointment twice a day. I was desired to visit him every other day. He continued perfectly well as to his pulse, feel of the skin, state of the bowels, and in great spirits till about four days after, when I perceived a cold clammy feel on the hands, with a tolerable good pulse, but without complaint.

plaint. I was induced to believe that this feel might arise from a pain from a contusion on his great toe, which was occasioned by a table being overturned and falling upon it. Upon my next visit I found that disagreeable symptom quite gone off; his hands very warm, dry, and comfortable, and his toe much easier, which seemed to confirm my suspicion.

As I wished to prevent any bad consequences as much as possible, and adhere to Dr. Turton's ideas, about six or seven days after his coming into the country, I increased the doses of musk to eight grains, and the cinabar to ten each, and the ointment to two scruples twice a day. In this manner he proceeded till January 12, without any symptom of illness or complaint whatever. I was as particular and minute as possible in my examinations, and could not find any tendency in his constitution but what perfectly coincided with health. I was sent for early on Wednesday morning, January 12, and upon my arrival was informed, that the young gentleman had complained about four o'clock in the afternoon of the day before, with head-ach and sickness; that he had a very restless night, and at this time could not swallow well. I was alarmed at the account, and
 sorry,

forry, as I visited him every other day, that he happened to be seized on my vacant day. Upon my entering the room I immediately perceived he laboured under a confirmed Hydrophobia. I called for something for him to drink: as soon as it was offered him he was immediately convulsed, particularly about the throat, and drank it with much agitation. This confirmed me in my opinion. He complained exceedingly of a pain in his head, and great thirst: his pulse was very quick, full, and hard; and he lay tossing about in the bed. I asked him if he felt any uneasiness in his lip. He told me he felt pricking pains about the part the evening before, and at that time he felt a soreness on touching it. I desired that every assistance that could might be procured. Two messengers were dispatched for two physicians.^k In the interim I gave him three doses of the above musk medicines every hour, and proposed bleeding him; but as farther assistance had been sent for, I deferred it till they came: they agreed in my opinion. I took about ten ounces of blood from the arm: they wished to see him take some liquid; he took it

^k Dr. Chapman then of Sudbury, and Dr. Gibbons of Hadleigh.

it in his hand, put it hastily to his mouth, and upon deglutition, all the muscles concerned in that action seemed very much convulsed. His tongue appeared clean, not dry. They ordered nat. and fact. cinnab. each eight grains, with ten grains of musk and one of opium, made into a bolus, to be given immediately, and repeated every three hours, without the opium. These he took regularly; likewise an injection with a pint of gruel, and two ounces of oil, thrown up for a clyster. A cloth wetted with oil was applied to his throat; his feet bathed with flannels dipped in hot water for a considerable time together, and four scruples of the strong mercurial ointment were rubbed in twice a day, as they wished to promote a ptialism. He passed most of the day in a chair, and now and then walked about the room. His eyes appeared very wild and red. He had a small stool from the use of the injection. He made very little urine: his blood appeared a little inflamed, and somewhat sily. In the course of the day he frequently took bread moistened in tea or gruel. He went to bed in the evening early, and got two or three hours sleep (I suppose from the effect of the grain of opium) after which he

appeared very restless and convulsed: towards the morning he was exceedingly so, and not able to lie still a moment, constantly calling for something to drink, and complaining of great thirst. He then swallowed with great anxiety and perturbation, and appeared in the utmost distress. On the morning of the 13th (Thursday) he rose about ten o'clock in the state abovementioned: about twelve his physicians saw him again; his pulse was about 130. They then ordered him twelve grains of musk; merc. emet. flav. two grains, opium one grain; to be made into two bolusses, with a little mucil. g. arab. to be taken every third hour. The opium to be added or omitted according to circumstances; and continue the use of the ointment. They had not left him an hour before he was taken with frequent vomitings, reachings, and constantly spitting a viscid phlegm. This came on before he took the turbith pills. He took one dose with opium as soon as it came, which was about two o'clock. He was very sensible and pertinent in his answers and conversation till now, when a delirium came on, with such fears and horrors as are scarcely describable, rubbing his throat, and walking up and down the room in great agony, but without any violence to any
one

one in it. He continued in this distressed state till about six in the evening, when he was standing up, and leaning on the housekeeper, and nature, from his incessant talking and raving, being exhausted, he dropped down in a kind of fit. He was then laid on a bed quite senseless, and speechless, groaning, foaming at the mouth, now and then vomiting a dark brown choler, and appeared as if strangled. He expired about half past eleven at night. His lip, after death, did not appear altered.

It should have been mentioned, that on the 11th he complained greatly of a pain in his right ear; and this was the first symptom observed. A flannel dipped in warm water was applied, to which was added a little brandy: by this method the pain abated in the afternoon of Wednesday the 12th.

CASE XII.

Communicated by Mr. John Hunter---reprinted from the first Edition.

DEAR SIR,

The poor French woman the dog bit a few minutes before Master Rowley, died last Tuesday

day se'nnight, at two o'clock in the morning. She was taken ill the Tuesday before with a pain in the wound, which rather increased. She called on me on the Thursday, but I was not at home. She called on the Friday, and I saw her. The cicatrix was very painful, and she seemed not to be perfectly well. At twelve o'clock that evening she was taken with a kind of fit. The apothecary was sent for, who gave her two grains of opium. I saw her on Saturday morning, when she had all the symptoms of the disease, although not violent. I ordered opium to be given, as much as they could get her take. The symptoms became more and more violent till she died.

From the time she took the first dose on Saturday about eleven o'clock, till she died, which was about sixty hours, she took only forty-four grains of opium; and 200 drops of laudanum in clysters.

The fores had caustic applied several times, but *not till several days after the accident.*

London, April 2, 1785.

CASE

CASE XIII.

Republished from the first Edition.

William Knipe, a farmer, near Kirby Stephen, was bitten early in March, 1784.¹ Till about the first of February, 1785 (eleven months after) he felt no inconvenience from the bite; when, in Kirby Stephen market, he complained of a pain, from the wounded hand up to his shoulder, and went home. On that evening the Hydrophobia took place, which held him, at intervals; and on the Thursday following he died: another case of the failure of the celebrated Ormskirk medicine.

CASE XIV.

Communicated by Dr. Rhodes, Surgeon to the Army---republished from the first Edition. The Patient was carried to the Edinburgh Infirmary, where the Treatment was prosecuted.

----- Christy, aged 11, was six weeks ago bitten on the right arm by a mad dog: nothing
was

¹ Vide Whitehall Even. Post, Feb. 12, 1785.

was done to the wound at the time. She has since taken a medicine that contained liverwort for one of its ingredients: has been sweated for a considerable time together, and taken some mercurials.

About three days ago some unfavourable symptoms appeared. On Sunday at one o'clock, P.M. she was taken into the hospital, and had the cicatrices of her arm cauterised, and took five grains of vol. alkali in a bolus.

At three she swallowed a second bolus of the same, but not without much persuasion. Starts sometimes, and seems much frightened; sighs frequently and heavily; talks in general sensibly, but sometimes raves; pulse quick, and very irregular; is much frightened if any cold touches her; starts, and is more convulsed in a recumbent posture than when she sits up.

At four an attempt to go to stool; is afraid we should shoot her; wishes to go to sleep; pupils of her eyes very much dilated; can bear the sight of a looking-glass, but not even the mention of water. Another bolus exhibited; she took it with more reluctance. At five vomited. A fourth bolus given; and though her intention is evidently to take it, yet her arms seem,

teem, contrary to her inclination, to be convulsed, and thrown away from the mouth, when near it. Has difficulty in putting sugar to her mouth, of which she is fond. At eight took another bolus of the vol. alk. and had a clyster administered, containing one scruple of musk, and fifteen drops of l. l. did not retain it. Another bolus given at ten o'clock, consisting of ten grains of musk, and fifteen drops of l. l. but she rejected it immediately. Seeing it was impossible to attempt another bolus, and from the bad success of the former clyster forty drops of l. l. in two ounces of water were injected, but with much difficulty.

At half past eleven o'clock all her former symptoms increased. Cannot now bear the sight of a looking-glass; fits more frequent; convulsions stronger; always raving; saliva from the mouth in great quantity, and appears bloody; complains greatly of her throat; has frequent retching to vomit.

Three o'clock, A. M. Has been raving constantly since our last visit; constant vomiting; flow of saliva more copious. At this time a bolus of ten grains of musk, and fifteen drops of l. l. was given, which she now took with much less reluctance than the former; but it
did

did not seem to get beyond the larynx: it was vomited up the next moment.

Four o'clock. Took another bolus, and seemed as if she could retain it: symptoms as before.

Half after five. Still raves continually; but sometimes makes sensible answers. Not so much convulsed of late, nor seem so much frightened; made some water; has just taken a bolus with little entreaty, and without the convulsed motion of her head as before.

Half past six. Is now in a perfect sweat over her whole body. Pulse rather calmer, but still too indistinct to be reckoned.

Seven o'clock. More delirious; weaker; convulsive startings less frequent; pulse irregular and weaker; bolus rejected, which she swallowed with as little entreaty as the last. Some moisture still on her skin, but chiefly on the upper part of her body, and of a clammy nature.

Half after eight o'clock. Still weaker; eyes very much contorted; pupils excessively dilated.

Nine o'clock. Sinks apace; is now without motion---dead. A little after death the pupils contracted to nearly their natural size.

DIS-

DISSECTION.

1 The whole surface of the body of a dun colour: nails livid; also some parts of the arms.

2 Head---D. mater of the natural appearance; nothing extraordinary in the ventricles; choroid plexus rather pale; veins on the surface distended with blood.

3 Fauces---Membrane lining the inside of the mouth of the natural colour; tongue also natural; epiglottis, larynx, and spaces between the cartilages of the trachea so very little altered, as to render it doubtful whether any thing redder than common: pharynx natural; submaxillary glands of the natural appearance. Parotids being cut through appeared redder; but doubtful whether the redness did not proceed from extravasation of blood from the cut vessels.

4 Thorax---Œsophagus natural; lungs much inflamed, and towards the back part of a lived appearance: pericardium and surface of the heart natural: a considerable soft whitish polypus in the right auricle, adhering loosely:
right

right ventricle no blood ; smaller polypus than that in the right auricle found in the left auricle, and adhering rather more firmly: little red blood in the heart.

5 Abdomen---Stomach natural ; some mucus in it ; two lumbrici ; that part of the intestines towards the end of the ilium contracted, and the coats thickened in some places : pancreas redder than usual ; all other parts found.



Though the following case has been already published, I republish it without abridgement, because the periodical work from whence it is taken is in the hands of only a few, and is chiefly confined to public libraries ; and because it is one of those instances heretofore produced of infection without a wound ;^m and I am persuaded the reader will not be displeased with its insertion. I am indebted for it to the Rev. Wm. Kirby, A. M. F. L. S. Rector of Barham, respectable among his friends for his love of science, especially his knowledge
in

^m Vide vol. 1, page 102.

in entomology. A translation, at his request, was procured for me, by Mr. Marsham, Treasurer to the Linnæan Society, from the Memoirs of the Academy of Sciences of Sweden, for 1777, in the library of Sir Joseph Banks, Bart. Pref. R. S. &c.

CASE XV.

By Dr. J. L. Odhelius.

Fortunately this cruel disorder is very rare in our native country, to which the temperate state of the climate greatly contributes; for violent heat, scarcity of water, also impure water, as well as putrid or putrifying animal food, are doubtless the principal causes of the infection of dogs, wolves, and other carnivorous animals, which often infect cattle, and not seldom the human species.

We so seldom see similar misfortunes happen to mankind, that not a single case has been announced to the Royal Academy of Sciences since its institution; neither does Mr. Runeberg mentionⁿ that a single person has died of this terrible disorder for eight years,
from

ⁿ In the Transactions of the Royal Academy of Sciences, 1775, page 221.

from 1766 to 1773 inclusive; also Dr. Dalberg, physician to the king, passes it over in silence in his last memoir concerning our climate.

Reports have occasionally arisen of such unfortunate accidents, e. g. in 1771; but an authentic case has seldom been known. The late Archiater and Chevalier Rosenstein mentions only a few certain accidents in his long and extensive practice. Last year Dr. Martineau and Professor D. Bergius had an opportunity of seeing a single one in a gardener of Mr. Kusel, the merchant, who died with symptoms very similar to those I now take the liberty of mentioning to the Royal Academy; which melancholy accident I may the rather be permitted to relate, as I partly was an eye-witness of all the symptoms, and so narrowly investigated all that happened, before any thing could be forgotten, that the Academy may entirely rely on the truth of it.

J. R. a gentleman's son, 12 years of age, complained in the morning of Midsummer day, 24th of June 1777,^o of being ill, but nevertheless

^o It is remarkable, that the great English physician, Mead, says he observed, that in the greatest number of Hydrophobics, the spasms which precede generally discover

less went with his parents to the park, where they spent the whole day. The 25th he was rather ill, but not so bad, but as he was of a peculiar lively disposition, to be able, on Thursday the 26th to go to school; and on coming home in the evening, complained only of a foreness in his thighs; on which account a napkin dipped in warm vinegar and brandy, was laid on during the night. The following morning, the 27th, he said he was well, and went to school again; but as he went, complained of being fatigued, which was not usual for him to do: he studied also as he used to do, but was unusually dull and heavy; and as he in the evening complained of his bowels, his mother gave him an infusion of senna, which purged him a good deal till the forenoon of the 28th, on which morning he drank tea; but about noon he had a great desire to go to stool; jumped up hastily, and exclaimed, *Oh! I have received a stroke in my breast, and sobbed*; by which he meant an oppression on his

B b breast,

cover themselves at the full moon. (vide his works, Paris edit. page 91). In this case the lad complained of being sick three days after the full moon: but who knows if he had not before felt himself ill, although he did not complain.

breast, and a difficulty of breathing. As he was obliged to be helped on the night chair, his mother thought he would faint, and offered him water gruel to drink, which he could not take, refusing it eagerly; appeared alarmed, and was very strange in his behaviour. The next night his sleep was unquiet; he was awakened by a noise in the street; jumped up hastily; complained of his breast, where he said he had *jobs*; also a stitch in his side and belly: he desired himself that I might be sent for, and that he might be bled. The 29th of June, at ten o'clock, A. M. I went to him, and found him sitting on a chair, with a fierce countenance, spasmodic catchings in his cheeks, his pulse high, his breath as if he were near being strangled, complained of a violent headache, and that he was much afraid.^p I looked at the inside of his mouth, where all appeared well except the palate (uvula) which was a little red and swollen: the tongue was clean, but rather red; his countenance was wild and reddish; his speech short, hasty, and interrupted, and he bit his under lip. His mother complained that the lad was so strange,

uneasy,

^p The urine was a clear lemon colour, with a bright cloud, a few hours before his death.

uneasy, that he would not drink, although he said he was thirsty. I then suspected a madness (rabies) and desired his mother to endeavour to give him tea in my presence; but at sight of it at a distance he pushed it away with both his hands, and said, with a scream, that he could not drink; at which time also the wildness of his countenance increased. At his mother's earnest entreaties he took a tea-spoonful of tea into his mouth, but made a wry face, and spit it out again immediately. I asked if he had been bitten by any dog, which both he and his mother denied; but she thought that the lad had fallen privately into the water, as he was very giddy and rash, and from thence had derived the dread of water, which he however entirely denied.

Bleeding in the arm was immediately ordered, and I desired his mother carefully to inquire if there were any mad dogs in the house or neighbourhood, with which he at least might have played. At four o'clock, P. M. I returned: he was bled about eleven, and about four ounces of blood taken, which was without crusta inflammatoria. The symptoms had at first abated a little, but were afterwards, by degrees worse; and were now increased, with
so

so great a dread, that he could not bear any one to approach to him, scarcely his own parents; nor any person to be in the room with him, wishing rather to be alone. He said also of himself, that all sense, at times, left him. At this time his mother informed me, that she had made inquiry, and learned that a little lap-dog that the lad was fond of, had shortly before been sick, and died on the 12th of June. The night before it died the dog lay with him in bed as usual; but he had been obliged to tie him, because the dog was shy and fierce, and did not know his master: it had also convulsions, bit its tongue, foamed at the mouth, and looked mad. The lad had, during the sickness of the dog, which continued some days, carried, handled, and probably kissed it, because he had complained to other people of the dog's stinking breath. A week afterwards another similar little dog sickened in the same house, in like manner, and died on the 26th of June: but as this belonged to other people, the lad had not handled it till just before his death, when he had patted his head and back, but denied having been bitten by either. I examined his body, but found no hurt, except
a lit-

a little rawness at the bottom of the back bone (spina dorfi).

As the disorder was now clearly a *Hydrophobia e cane rabido*, because the breath and saliva of mad dogs is looked upon as most poisonous and infectious,^q I represented to the parents in what danger the life of the lad was, and desired them to send for their usual physician, Dr. Martinau, who was however not met with. I prescribed in the mean time half an ounce ungt. merc. ph. so. which should be rubbed on the arms and legs after he had previously sat at least half an hour in a lukewarm bath, when a sheet was wrapped round his neck to conceal the water from his eyes; after which, the body to be dried, and the ointment to be used. At seven o'clock the same evening I returned; every thing I ordered had been performed, but the symptoms increased rather than diminished: now, besides what is before-mentioned, strong belchings, or noises in the belly, were heard: the nostrils were contracted, and the underlip was more constantly bitten, with a small spitting, and the senselessness in-

^q Two cases where the Hydrophobia arose only from the licking of mad dogs. Vide Soc. Hafn. Collect. Med. vol. 1, page 273.

increased. In consequence of the gripings a well-salted clyster was applied, which had a good effect. A bolus was brought from the apothecary's, which consisted of two grains of opium, and ten of musk, which was swallowed with some difficulty; upon which he sucked eagerly the corner of a piece of linen, which was dipped in rhenish wine: he also endeavoured, in consequence of the violent thirst, to squirt himself with some of the same wine, but could not retain a single drop. I also advised his being bled again, or having leeches applied to his neck. At ten o'clock the same night I returned to the patient; all the symptoms were still worse; especially the dread of people. Bleeding or leeches had not been applied, because the patient constantly refused. I urged the necessity of them in a degree to ease the oppression of the breast. The Hydrophobia was so violent, that the least moisture applied with a feather to the dry lips, increased the convulsions. It was not possible to bleed him before two o'clock in the morning; but then it was effected after the convulsions had extended themselves both to the hands and feet, and deprived him of all sense. The blood now taken, to a quantity of three
 ounces,

ounces, had also no crusta inflammatoria; but this gave no ease; on the contrary, the convulsions were now incessant; no senses could be discovered; violent screams, with an enfeebling of the spasms, and a coldness of the extremities foreboded death; and about eleven o'clock A. M. of the 30th of June, he expired quite calmly.

The corpse became fœtid very soon. On laying it out the following day, lived spots and blisters of blood were observed on the breast, and about the neck.

The following remarks seem to offer themselves from the present case.

1st. At neither of the bleedings the blood appeared inflamed: the disorder therefore is not in the humours, but in the violent agitation of the nervous system, by a peculiar poison, which attacks the breast and throat. When a fever arises it must, in such cases, be a consequence of spasms from the irritation of the arteries, as clearly happens in the small pox, venereal disorders, and after the operation of the cataract. Is therefore methodus antiphlogistica the proper remedy? Is it not desirable for us to discover some powerful medicine for quieting the nerves, as would be able
to

to quell this powerful irritation? It appears that assistance ought to be expected from this last class of remedies.

2nd. The Hydrophobia did not appear before the violent oppression of the breast at noon, on June the 28th, although the poison clearly acted from the morning of the 24th of June: it is therefore a consequence of a more violent degree of irritation where spasms arise in the throat, breast, and face.

3rd. If mercury, which has hitherto been regarded as the most certain means of preventing the Hydrophobia, when used in time, acts as a specific against the poison, as in venereal disorders, it is however ineffectual when the Hydrophobia has discovered itself.

Finally. I ought also to mention, that two other children in the same house, a daughter of 20, and a son of 14 years of age, were bitten on the left nostril by the mad dog that died last, shortly before his death; but the bite neither drew blood, nor caused pain; neither was there the least mark when I examined the place on the 29th of June. As however there might be danger of unfortunate consequences, they both the same evening began to use mercury, as well *in*, as externally, together with bleed-

bleeding and cooling purges, of the result of which I may hereafter probably give an account.

Cases epitomised from different Authors.

CASE XVI.

Dr. Ferriar's first patient, John Johnson, aged 39, bitten by a dog in the left cheek, about the end of August, 1790.^r

This happened near Manchester. Dec. 3 was brought to the Infirmary.

Symptoms. Dr. Ferriar examined him on admission, and found tongue white, pulse irregular and weak; body tremulous; eyes wild; fearful, timorous, and on the watch, as it would seem, against sudden surprises. Complained of some cough, pain of chest, dyspnœa; but avoided mentioning dread of water; said he had been twice bled and blistered on the side the preceding week. Four days ago first felt difficulty of swallowing: at present this was his chief complaint. Attempting to drink, muscles

^r Vide Medical Facts, vol. 1, page 1.

cles of face convulsed ; and a gulping at sight of water : swallowed solids with ease ; great uneasiness about his throat from the cold air : slight incoherency in conversation ; fear from wound trifling ; started at the sound of water poured from a vessel ; then recollecting himself, said he was not afraid of water. 9, P. M. More incoherent ; complained of cold ; during the night intractable ; incoherent ; attempted to get out of bed ; scratched the hand of an attendant who replaced him.

4th. 9, A. M. Less difficulty in swallowing; had taken a pint of a mixture ordered, and ate some porridge: eyes heavy, inclined to fix; pulse much sunk; tendency to low delirium; "retched several times, and brought off some wind." 10, A. M. Threw up part of a mixture just taken---convulsions---death.

Treatment. Bolus of a scruple of bark, fix grains of musk, half a grain of opium. Cold bath; directed to swallow, as often as possible, a mixture of vinegar and water. Consultation held---result. Scarify the cicatrix deeply; apply a blister over; take every four hours in bolus a scruple of bark, fifteen grains of musk, two grains of opium: rub strong merc. oint. two drams into throat, arms, and groins: also

take three or four large spoon fulls, as often as possible, of distilled vinegar eight ounces, decoct. cort. per. twelve ounces: apply to the throat a plaister of galbanum three drams, opium two scruples, camphor one dram. He took of these medicines a considerable quantity, but without relief,

N. B. From the time of the accident to the appearance of the disease, he had been twice afflicted with complaints, supposed to be pleuritic, which were removed by bleeding, blistering, and other remedies,

CASE XVII.

Dr. Ferriar's second patient, aged between 40 and 50 years, bitten by a dog in the right thumb, about the 26th of July, 1796.^s

Was brought into the Manchester Infirmary, October the 12th, from Salford, near that town, being the sixth day of the disease, and died the same day.

Prophylactic. Apprehending no danger, no prophylactic was used.

Symp-

^s Vide Med. Hist. and Reflections, vol. 3, page 5.

Symptoms. October 6. Deglutition slightly affected. This day delirium; complained of the cold air when the door was opened; and of his throat, imagining it to be swelled: timorous; startled at every noise; thought himself harrassed by witches, dogs, and other annoyances. Some convulsions on the 4th day of disease; attempted no violence, though his phrenzy rendered it difficult to hold him. Did not remember the bite, nor supposed his illness arose from it, till the day before his death, and then only recollected when interrogated on the subject. It rained when he was about to proceed to the Infirmary, which affected and disturbed him: strength at this time seemed not very greatly impaired, as he declared, that but for the rain he would walk to the Infirmary, instead of being carried in a hackney coach procured for him. Left the carriage at the gate, and walked through the garden to the Infirmary, under much agitation from the shower. A little after entering, convulsions: much ropy saliva for the first time; died soon after, before the Doctor could arrive.

Dissection. This, to the Doctor's regret, (and the public will readily join in it,) was deferred,

red, through misplaced delicacy of friends, for about 24 hours. Leave at length being obtained, the appearances were,

Externally. Corpse remarkably pale, cheeks excepted, which were somewhat livid.

Internally. Head----effusion of fluid between the pia mater and tunica arachnoides, considerably distending the former. No preternatural quantity in the ventricles; pineal gland contained fabulous matter, with a curious appearance of ossification on one of its peduncles.

Thorax. Some adhesion of the pleura covering the right lobe of the lungs to that lining the ribs on the same side. "The left lobe was so completely filled with blood, as to have acquired considerable weight and solidity."

Abdomen. Liver changed in colour, and streaked with white spots.

Stomach. Much inflamed, especially on the great curvature: villous coat inflamed in irregular points, with an appearance of abrasion similar to those found in the Doctor's former patient: inflammation did not extend beyond the villous coat; for, cutting into the muscular coat, it was found quite sound.

Pylorus----sound.

Æso-

Œsophagus----found.

From the above appearances Dr. Ferriar is inclined, contrary to his former opinion, to consider the disease as of an high inflammatory nature, analogous to peripneumonia.

No notice is taken here of the heart. This omission is to be regretted.

CASE XVIII.

Mr. Johnston's patient, Thomas Hogg, aged 33, bitten by a dog in the right leg, and right hand, on the 13th of December, 1793.*

This patient lived in the neighbourhood of Dunbar, where the accident happened. This unfortunate man possessed both fortitude and humanity. When the dog seized him, he caught the creature by the two jaws, and held it fast. Being desired by a fellow servant, who came to his assistance, to let it go, he refused till it should be killed, replying, "that if the animal was mad he was as ill as he could be ;
but

* Vide Med. Comment. D. ii. vol. 10, page 264.

but that if he let it go, it might do more mischief." It was killed while he held it.^t

Prophylactic. Wounds bathed with warm milk and water; the bleeding encouraged; wounded hand poulticed; extirpation of the bitten parts in leg; extirpation also of bitten part on palm of hand; lunar caustic to the scratches of finger and back of the hand; supuration encouraged;^u antiphlogistic regimen inculcated; mercurial pill ordered; wounds dressed with mercurial ointment; took Orm-skirk nostrum. Notwithstanding these precautions Hydrophobia took place.

Symptoms. Jan. 9, 1794. Some uneasiness; shivering; could not keep himself warm; some thirst. 11th. Some hardness, with numbness round the wound in the leg; hand and fore arm also uneasy; now with a pricking sensation, and now with sleeping: visited to day several friends with Mr. Spence, who has lent his medical aid in consultation. He appeared to Mr. S. "uncommonly cheerful, distinct, and collected." 12th. Wound in hand uneasy;

^t For inspection of this dog's stomach, vide vol. 1, p. 28.

^u Vide vol. 1, page 155, for probable reasons for the want of success.

easy; squeezed some matter from it; pricking pain extending to the elbow. 13th. Visited at four miles distance, and dined with his father; returned in the evening. 14th. In seeming health; drank some beer without inconvenience. 15th. "This morning he was seized with a nausea, and strong desire to vomit; and in the forenoon occasionally brought up mouthfuls of what they termed yellow stuff, which to him had a bitter, sour, disagreeable taste." Oppression about pit of stomach, breast, and bowels; drank without aversion. 10, P. M. Pulse 80; small and hard; desirous to sleep. 16th. Pulse 100. He is fretful and uneasy; no sleep last night; oppression at pit of stomach; afraid of fainting; fluids refused. 3, P. M. Profuse sweat since morning; afraid to take food or liquids, from pain at the pit of his stomach. "He had nausea, and at times attempted to vomit." Pulse 90, hard and firm; deglutition difficult on attempting to drink. About 5, P. M. "Frequently had a desire, and did retch repeatedly during the operation of a laxative given, and at first brought up only a few mouthfuls of bile; but what was vomited afterwards appeared to be only the mucus of the stomach." Irritability increased; sighed

sighed often; cold air, whether by motion of persons through the room, or by opening a window, offensive; "he repeatedly declared it was killing him; at other times he said it was taking away his breath, and like a knife entering his stomach and breast: even the sense of smelling was preternaturally increased." A person approaching was requested to withdraw, because he smelt of spirits. 8, P. M. Perspiration continues. 17th. Last night restless; towards morning pulse augmented to 110; constant danger of fainting. 12, A. M. Pulse 90, hard and small; he is perfectly collected; could not bear the barking, or mention of a dog; sometimes cold air agreeable, sometimes the reverse; "it went to his heart like a knife:" whenever convulsions of the stomach and diaphragm recurred, would call out to open the window, to relieve him from suffocation; and then, with a nusus to vomit, would bring up something like mucus and saliva, evidently very offensive to him: saliva copious, and forcibly ejected, not at any person, but in the position in which his head lay; morbid sensibility of touch is a great obstacle in the administration of an enema; contraction of the rectum; when injected fell into convul-

sions from the touch of the fluid ; passed urine involuntarily after enema with T. op. short interval of ease ; convulsions, with more copious flow of saliva forcibly ejected in mouthfuls ; frequent sighing ; refused farther relief ; told his doctor, that what time he had left him he would employ in supplicating intercession with Christ ; called his family round, and bid them farewell ; was rational to the last in the intermission of convulsions, and perfectly resigned. 4, P. M. Convulsions stronger ; in the fit outrageous, requiring two men to hold him ; pulse at wrist indistinct ; evident pulsation of the temporal artery ; salival discharge still increasing, with mucus from the stomach, “ infomuch that his constant employment was spitting and vomiting.” 6, P. M. Death.

“ No enlargement about the throat or salivary glands could be observed ; no inflammation was evident about the mouth, nor was there any enlargement of the tongue. We were not permitted to inspect the stomach, bowels, or thorax.”

Treatment. 15th Evening. An emetic. 16th Purgative of castor oil ; “ it produced a most offensive and bilious stool, followed by five others equally offensive and bilious.” 17th.

At

At noon, ordered an enema of T. op. three drams, beef tea four ounces, every two hours.

One only could be given: anoint breast, stomach, and belly with the same.

CASE XIX.

Mr. Simmons's patient, Mary Strong, aged 43, bitten by a dog on the middle finger of her left hand, about the 23d of June, 1793.^v

This was in London: Symptoms---August 21, some difficulty in swallowing. 23d. Mr. S. first saw her; horror now at the sight of water; could swallow solids; ate an apple in his presence; pulse natural; thirst great. 24th. Night restless; pulse considerably quicker; an almost impossibility of swallowing; distressing convulsions at the attempt. 25th. About one P. M. Last night still more restless; discourse incoherent; hiccuped; spat often a viscid saliva; foam about mouth; pulse not perceptible; countenance wild; speech altered. 3, P. M. Death. A little before this event "she vomited

^v. Vide Med. Facts, vol. 5, p. 87.

mitted about a pint of something like coagulated blood."

Treatment. Ordered a clyster; repeated afterwards; ordered an opiate pill; also friction, with merc. oint. Little opportunity afforded for practice in this case.

CASE XX.

In Edinburgh Royal Infirmary: a woman, aged 74, bitten by a dog, on the hand, July 3, 1792.^w

This patient continued well for 73 days, i. e. from July 3, to Sep. 13, and the disease did not prove fatal till four days from the commencement.

Prophylactic---none mentioned.

Symptoms. 1st. Pain in cicatrix, stretching up the arm. 2nd. Shivering, heat, thirst, nausea, and other febrile symptoms in succession. Next day (Sep. 14) Difficult deglutition perceived; symptoms increased, "with all the other attendants of rabies." Brought next day (15th) at

^w Vide Med. Comment. D. ii. vol. 7.

at 7, P. M. to the Royal Infirmary. 17th.
Death.

Treatment. Opium, æther, camphor, with
"other powerful antispasmodics."

Dissection---none mentioned.

CASE XXI.

Dr. Bensell's patient, --- Niece, a girl between 7 and 8 years old, bitten by a dog in the face, arm, and ankle, March 30, 1792.*

This was near Germantown, in America. It is of importance to notice the state of the dog at the time of the accident. Some indisposition was observable, but by no means distinguishable in its nature, nor indicative of the necessity of securing him previous to the accident. They would doubtless have found, had they made the experiment, that he would neither, at this time, have refused meat nor drink, a fallacious rule of judging of madness in this animal, credited for ages past.

Symp-

* Vide Trans. of Coll. of Physicians, Philadel. vol. 1, page 238.

Symptoms. April 16, Dr. Bensell first called; patient indisposed for 16 hours past, accompanied with slight impediment in deglutition; had been bitten 19 days before; uncommon apprehension at the approach of objects; skin moist; heat moderate; pulse somewhat quickened; tongue partially white, not dry; intellects sound; countenance marked with a peculiar dread and wildness; pupil uncommonly dilated, yet the light fell upon the eye in a direction favourable to produce contraction; no thirst; a cup of water poured out at the other end of the room threw her into great agitation; a trial to swallow produced deep sighing and sobbing. Evening. Little alteration; pupils remain unnaturally dilated; whiteness of tongue not more extended, but appeared in spots; its moisture undiminished; pulse regular; no thirst; natural heat over the body. 17th. Symptoms the same, only deglutition freer. 3, P. M. Apprehension at the approach of objects increased; deglutition very difficult; convulsed when a fluid is presented; danger of suffocation if it touched the fauces; pulse continues moderate; heat of body the same; tongue little altered. Evening. A dog entered the room; frightened at the sight, requesting

questing the animal to be turned out. 18th. Begged to be dressed, in which she was indulged; countenance florid till to-day, now pale; pupils even more dilated than before; conscious of illness, yet declared she felt no pain; seemed rejoiced at seeing Dr. Bensell; pulse now became lower; spasms now more frequent. 4, P. M. Great aggravation of symptoms; convulsion suniversal; pupils so dilated, that only a line remained to distinguish the iris; pulse scarcely to be felt; tongue changed to brown, yet even now her intellects perfect; hitherto little or no phlegm thrown up, but now an extremely quick vibratory motion of the tongue produced some froth about the mouth; dread of every thing greatly augmented. "At this time a quantity of viscid phlegm was at intervals brought up, generally tinged with blood." As this multiplied, the difficulty of ejecting it increased, till at last every muscle seemed employed in the exertion. 6, P. M. Froth more multiplied, yet when wiped away she would speak to her parents rationally. 11, P. M. Death.

Treatment. Eight drams of strong mercurial ointment rubbed in during the disease; warm bath frequently; blister over the scar, but

but no inflammation was produced, either under the plaister, or on surrounding parts; no pain either before or after application of blister; no morbid appearance on the wound.

Prophylactic. A celebrated nostrum sold by Goodman of Philadelphia was administered, according to the directions, soon after the accident.

CASE XXII.

Mr. Scruton's patient, a girl 8 years of age, bitten by a dog, March 21, 1792.*

This took place at Glasgow: no mention is made of the part in which the wound was given, whether it was about the face, fore part of the neck, arm, leg, &c. To know this is of some importance: we are enabled thereby to judge, when an unsuccessful operation is performed, as in the present instance, what were the obstacles, still concluding that the surgeon has omitted nothing necessary to render the operation complete.

Pro-

* Vide Med. Comment. D. ii. vol. 7.

Prophylactic. Mr. Scruton removed the bitten part; next supported a discharge for some length of time; lastly, administered calomel, keeping up a salivation for a week or two; yet the disease appeared April 27, or 38th day from the accident; and the child died on the 29th.

Symptoms. In the sketch from whence this is extracted the symptoms are not detailed. It is only said, that the patient was affected with "Hydrophobia, and other symptoms of rabies contagiosa."

Treatment. This is omitted likewise.

CASE XXIII.

Dr. Shadwell's patient, Joseph Wyburn, aged 15, bitten by a dog in the left hand, 1790.²

This took place in the vicinity of Brentwood. In this we have another instance of the futility of that observation respecting the refusal

² Vide Mem. of Med. Soc. Lond. vol. 3, page 457.

usual of a mad dog to eat or drink in the early stage of the disease. The animal by which this lad was bitten ate bread and milk, its usual breakfast, the moment before.

Prophylactic. The Ormskirk nostrum was taken, and sea bathing used.

Symptoms. Dec. 14, Pain in the left ear. 15th. Pain extending to the tonsils; dull; seemed to avoid company; able to drink; slept as usual this night. 16th. Went to his usual employ, but appeared, as they termed it, comical. This night screamed out; hurried out of bed, called out, "thieves," and imagined he saw lights and persons in the stable. 17th. Shuddered at the sight of milk offered him; shuddered and turned away when offered tea, clinging through fear to the mantle piece of the chimney; said he was stifled by the cold air; "and, to the astonishment of the spectators, he ran up stairs, as fast as could be conceived, backwards," in order to shun it: fell into convulsions; passed some drops of urine, and, exhausted, fell into a swoon; became furious, and was bound down in bed; thirst great. 18th. Symptoms worse. 19th. Evening. Dr. Shadwell first called; at this time the body was writhed and convulsed; pupils
amaz-

amazingly dilatéd; nails of fingers and toes perfectly bleached; "saliva streaming from each side of the mouth;" rigidity of every muscle; shrieked loudly; pulse low; skin cold to touch, yet complained of burning oppression, with lancinating pains about the region of the stomach. Tongue. "Nothing particular appeared, but a lead-coloured stripe running along the middle of it:" rational in the interval of fits. 20th. "Complained to me of great stoppage in his throat, and load at his stomach, and said he could vomit if carried into the air:" pulse not to be felt; skin livid. "After some violent paroxysms, the saliva streaming more copiously than ever from one side only of his mouth," Death. This took place at 11, P. M.

Treatment. On the 19th was anointed with oil from head to foot; oil ordered internally, but could not swallow any. Dr. Shadwell reasoned with him persuasively to try; he consented, but it being presented, "he wept bitterly, turned his head away from it, and declared his desire rather to die than to attempt any farther endeavours at drinking." 20th. Was thrice anointed during last night; no oil internally; for the very mention of it made him out-

outrageous. Enemas ordered of oil and fat mutton broth; one only administered, and with the greatest difficulty.

N. B. No priapism; never lost his recollection; knew the by-standers; when asked to name them, he pointed to each; wound not inflamed, but he said it felt rather sore; swallowed nothing from Saturday till death; retained his sight notwithstanding the great dilatation of pupils.

Dissection---none permitted.

CASE XXIV

Mr. Weeks's patient, George Cobb, bitten by a dog on the right cheek, and inside of the upper lip, Nov. 29, 1789.*

Mr. W. saw him immediately after the bite, but could not persuade him to have the parts that were bitten extirpated. The Ormskirk medicine was administered, and the Birling medicine was also given. The lad continued
in

* Vide Med. Facts, vol. 3, page 35.

in health for ten days after the bite, and the wounds healed ; but on the 10th of December symptoms of Hydrophobia appeared. The Birling medicine was now again administered ; but by two o'clock of the morning of the 12th of Dec. the patient appeared quite exhausted by the violence of the symptoms, became quiet, and died in about half an hour after.

Treatment---none attempted.

CASE XXV.

Mr. O'Donnel's patient, John Slight, aged 23, bitten in the calf of the right leg by a dog, on the 7th of Oct. 1788.^b

Prophylactic. Caustic to the part ; discharge kept up for a month ; mercurial ointment daily for the same time ; Ormskirk medicine according to rule ; and it is added, to insure success, he took doses of double the common quantity.

Symptoms. Dec. 5, sixty days after, became first affected : cold sensation in the foot
of

^b Vide Med. Communicat. vol. 2, page 290.

of bitten leg. 6th. Same sensation extending to knee; otherwise well. 7th. Numbness extending up the thigh. 8th. As yesterday. 9th. Very ill; took to bed; thirsty. In the evening, dull, dejected, trembling as he sat by the fire; bitten leg now somewhat swelled. 10th, in the morning, horror to fluids: this forenoon pain of hip and side bitten; pulse quick and weak; tongue moist, red in the middle, and white at each side; last night sleepless; skin moderately warm, somewhat moist; deglutition difficult; patient had no apprehension of Hydrophobia. 9 in the evening, pain in the loins gone; eyes penetrating; darted them with uncommon quickness on the viewed object; no pains, at this time, in any part; pulse now 130; agitation increased; tongue and skin as before; distressed at the bare mention of drink. 11th. Noon, cannot look at his urine; had slept some time; perfectly rational; pulse irregular, weak, quick. 2, P. M. more restless; temper changed; struggled with his attendants, bit the finger of one, and scratched the other with his nails; became violent, with the strength and fury of a mad man; was confined by the strait waistcoat; foamed at mouth; aspect terrible; coughed
 confi-

considerably in ejecting saliva; voice somewhat resembling the coughing of a dog with a bone in his throat; sensible now of his situation, but threatened the by-standers if they refused to unbind him. Eight o'clock, every thing worse; soothing language judiciously used by the surgeon. This brought him to reason, and his answers were now pertinent: involuntary emission of urine; begged not to be smothered; put out his tongue when desired, which appeared greatly enlarged. 11, P. M. Delirium *mite*, resembling what is seen in typhus; face of the bitten side swelled, so that the eye seemed closed; other side free from swelling. Death, half past 12; continuance of Hydrophobia thirty-nine hours and a half.

Treatment. 10th. Bolus of musk ten grains, opium two grains, every four hours. No sleep from the bolus. 9, P. M. Ordered to continue bolus, and to rub half an ounce of strong mercurial ointment on the throat. 11th. Noon. Camphor a scruple, opium six grains, in a bolus; rub an ounce of mercurial ointment into the throat. 4, P. M. Bolus of six grains of opium.

CASE

CASE XXVI.

Dr. Gray's patient, a slave boy, aged 12, bitten by a dog on the left thigh, the left arm, and on the back, about Nov. 25, 1786.^c

This was at Bengal.

Prophylactic. Dr. G. did not see the patient till Dec. 15, or about three weeks after the accident. He found five large ulcers on the thigh still open; on left arm two small cicatrices, and one on back; pulse at this time small, quick, and somewhat frequent; bowels regular; head-ach, with chilliness. Lunar caustic to the ulcers of the thigh; blisters to cicatrices of arm and back; frictions, with mercurial ointment to thighs and body; also every three hours a pill of half grain opium, and one grain calomel. 16th. In the morning, was in health; little or no fever; appetite good; ulcers on thigh discharging; cicatrices on arm and back also opened. On these being opened by blister, "small but deep ulcers
ap-

^c Vide Med. Comment. D. ii. vol. 2.

appeared underneath, while the neighbouring parts, that were equally affected by the plaister, were scarcely inflamed." Ulcers fumigated with cinnabar; escharotic applied of half blistering plaister, half diachylon. Warm bath several times to-day, for 30 minutes each time. Evening. Gums sore; pills continued. 17th. In the morning. Rested well last night; little or no fever; appetite good; gums red and swelled; saliva increased. Ulcers discharge as yesterday; fumigation repeated; warm bath now and then; passed this night well. 18th. In the morning. No alteration, except more saliva, with ulceration on edge of tongue. This and the saliva ascribable to mercury.

9, P. M. Symptoms of disease first appear; pulse rather quick and frequent; subsultus tendinum; restless night. "Sleep every moment interrupted with frightful dreams of horses fighting, and going to eat him up." 19th. In the morning. Looked fatigued; pale, yet appetite good; chilly frequently; used warm bath frequently; saliva and gums as yesterday; ulcers discharged as before; febrile symptoms increased. Night. Perfectly sleepless. 20th. In the morning. Fatigued for want of

rest last night ; difficult deglutition this morning, but swallowed some liquid. “ Eyes had a peculiar keenness, and appeared luminated, moving with extraordinary rapidity ; and all his actions were performed with a remarkable degree of quickness.” When ordered warm bath “ ran with the utmost precipitation and timidity.” Pulse small ; frequent ; every now and then shrinking from his attendants ; often mentioning the word *cuta* (dog) without appearing sensible of being hurt by that animal ; appetite still good ; swallow solids with little difficulty ; unsuspicious of danger ; he hoped soon to be well ; this night greatly agitated ; passed it without closing his eyes. 21st. In the morning. Attempting to swallow water ; convulsions ; contortions of face ; danger of suffocation ; yet swallowed a little water from a spoon ; swallowed solids with less difficulty ; devoured some bread and butter voraciously ; yet went frequently into warm bath, feeling cold when out of it ; pulse frequent and small ; gums and tongue swelled and sore ; spitting diminished ; convulsions of face increased ; eyes rolling extremely, “ as it were with dread of the objects near him ; shrinking back, at the same time pushing his hands out before him,

seem-

seemingly to ward off some disagreeable object." These fits momentary only; could give no reason why he was so affected. 12, A. M. Fits more severe, both in and out of warm bath; thirst insatiate, but horror and convulsions over his whole frame on attempting to drink. 6, P. M. Could no longer go into the warm bath; the name of both liquids and solids excited fits. "During the last 24 hours he complained of acute pains shooting from the ulcers of his arm to the neck, breast, and head; but had no uneasiness from those of the thigh or back." 8, P. M. Pulse at wrist not to be felt, while strong throbbing and pulsation continued at his heart, with extremities cold to touch; outrageous and frantic during fits, scarcely to be held by three men; exacerbation of fits every moment; chest now convulsed; the air at this time forced out of his lungs with a convulsive noise; smote now his breast often, "crying out that his inside was on fire;" kept calling out at this time to his God, in his native language, to deprive him of life, and relieve him from misery. "From ten o'clock in the evening, till four o'clock in the morning of the 22nd, when he died, he had continual efforts to vomit, but without effect."

Unless

Unless during the fits, his intellectual faculties were not the least disturbed.”

Treatment. This is comprehended in the prophylactic, and in the symptoms. To what is found there may be added the application of a blister to the fore part of the throat when deglutition became impeded, which, after three hours, removed the impediment for a time.

In this case the warm bath had the fullest trial, not only from the 15th, which was three days before the disease appeared, but throughout its duration. The bath was kept constantly warm, and the boy was accommodated with a contiguous apartment for the purpose. He bathed frequently every day, even to the last.

CASE XXVII.

Mr. Dundas's patient, Henry Rider, aged 40, bitten by a dog in the wrist, Aug. 1785.^d The accident happened in the neighbourhood

^d Vide Lond. Med. Journal, vol. 8, p. 156.

hood of Richmond. Rider immediately shot the dog (it was his own) "it having bit a pig; and shewn an inclination to bite all who came near it."

Prophylactic. Some hours after the accident he applied to Mr. Dundas. "As the wound was inconsiderable, and there was no certain proof of the *madness* of the dog," Mr. D. dressed with common ocreate; advised Ormskirk powder, which was taken next day; applied the same to the wound, as ordered by printed directions; bathing in the sea in the usual way recommended; remained well for about 18 months; end of Dec. 1786 failed in business (kept an alehouse) to avoid creditors absconded; remained in London.

Symptoms. Feb. 23, 1787, dining on tripe with friends, suddenly imagined a piece to have stuck in his throat; tried to drink some porter at table, but could not: in a second attempt was almost strangled: walked home; felt rigors and oppressions; could not go to bed. 24th. At breakfast swallowed some bread and butter; could not swallow tea. Afternoon went to Richmond; consulted Mr. D. imagining the tripe eaten yesterday still to stick in his throat; hoped he would be able
to

to push it down; but his wife acknowledged a dread of the bite haunted him. On asking him whether he felt uneasiness in the wound made by the dog, answered Mr. D. "he perceived what his opinion was, and was ready to submit to his fate:" was agitated, oppressed: complained of weight at stomach; indiscribable anxiety; pulse quick, small; eyes wild; little head-ach; great thirst: attempted to drink in Mr. D.'s presence; violently convulsed; touching water with his hand had nearly produced the same. No discoloration or swelling in bitten wrist; but said it had itched for some days: Hydrophobia had continued 27 hours. 25th. Had not been in bed last night; retired to corner of room; looks wild; pulse very quick; made an uncommon noise; admonished those about him not to fear him, but wished not to be spoken to: sight of a stranger agitated him. About noon became unruly; bound now in strait waistcoat; paroxysm yielding, he became more quiet; was oppressed in mind; "imagined he was to be smothered betwixt two feather beds:" at each visit from Mr. D. was alarmed, least this should be ordered: this idea he could not banish; concealed his complaints from Mr. D. on this

ac-

account; continued sensible till next morning; (26th) at four; gave orders about his funeral; took leave of his wife; fell into convulsions; in a few minutes dead.

Treatment. Feb. 24, bled in London in the morning; took some purging pills. Evening. Mr. D. was consulted: blister to back; merc. oint. an ounce, to be rubbed into legs and arms every two hours; enema of T. fœtid. an ounce, T. op. 50 drops, every four hours; Turp. mineral recommended; could not swallow it.

Dissection. Brain---no marks of disease.

Pharynx, and neighbouring parts, without inflammation.

Œsophagus and trachea were both covered with a thicker mucus than usual. Mr. D. thinks this explained by the patient's inability to swallow for 56 hours.

Left lobe of lungs, and great lobe of liver, *appeared* inflamed; the other viscera healthy.

CASE XXVIII.

Mr Haighton's patient, William Macey, 5 years old, bitten by a dog in the right ear, Aug. 4, 1785.^c

This happened in Kent-street, Southwark. Wounds extremely slight.

Prophylactic. Wound dressed with some common cerate.

Symptoms. Aug. 24. Pain in the cicatrix, but no inflammation, and the place scarcely to be discovered: a few hours after great uneasiness in the epigastric region; took food as usual this day; slept a little at night. 25th. Pain in abdomen continues; laborious respiration commencing; refused all refreshment: this night no sleep; constant restlessness. 26th. 1, P. M. Mr. Haighton first visited; child sat on a woman's lap; face then pale; eyes fixed; horror of countenance; pupil dilated, yet in a strong light capable of great contraction; heat of body moderate; tongue moist, and covered with white mucus; pulse 120; was perfectly
rati-

^c Vide Lond. Med. Journal, vol. 6, p. 362.

rational, answering questions pertinently; breathing continued laborious; offered drink; started from it as from an instrument of death; soon after called for drink, swallowing a cup of milk with avidity. "When the spasms were very violent (for they were not always equally so) he would cry out, with a tone expressive of horror, 'I will not have any thing to drink,' and this even at times when nothing was offered to him." Though rational for the most part, yet imagination occasionally disturbed, "for he would point towards the bottom of the bed, and start as if something frightened him, although no apparent object could be discovered:" would now and then look round, as if with apprehension, or with suspicion of his attendants. "A few minutes after he had drank the milk, some of it regurgitated in a state of partial coagulation, and mixed with a fluid of a cineritious colour." Though no deficiency in motion of lips, yet some in voice; for he would articulate several words well, then, on return of spasms, "his voice became reduced almost to a whisper." Respiration frequent, irregular; chest chiefly dilated by the intercostal muscles, for the ribs were elevated and depressed in a considerable degree, without

out a proportional alteration of figure on the abdomen." 3, P. M. Symptoms more violent. 6, P. M. Death.

Treatment. Leeches to the epigastric region; fomentations with poppies; a blister.

Dissection. Leave could not be obtained. This is the more to be regretted on account of the accuracy which would have been observed by Mr. (now Dr.) Haighton, whose anatomical knowledge is well known.

CASE XXIX.

Dr. E. Johnstone's patient, Charles Bullock, aged 4, bitten by a dog on the right cheek, and just under and above the right eye, on the 9th of July, 1784.^f

The accident happened near Birmingham.

Prophylactic. Wounds were small; bled little; soon healed; took Ormskirk nostrum next day after bite; applied some to wounds. Aug. 1. To-day dull; passed night restless; recovered

^f Vide Mem. of Med. Soc. Lond. vol. 1, page 255.

covered health next day ; continued well till the 15th.^g

Symptoms. This day low, spiritless ; little appetite ; breath very offensive ; pain shooting from part bitten to teeth ; night restless. 16th. Dr. Johnstone first visited ; found him in midst of friends, walking about the room, under great anxiety, horror ; look peculiarly fierce ; started on the doctor's entrance ; apprehensive of being sent to the salt water ; when assured to the contrary was pleased and composed. Attempting to drink, turned away, changed colour, felt horror ; convulsions about the throat, with catching of breath ; became tranquil on removal of the liquor ; ate some bread and butter ; felt same sensation from cold air, as from fluids. On putting hands into a basin of water, convulsed about throat, and universal tremors, with a sobbing half respiration, "and such an inexpressible anxiety and gloomy horror of countenance, such a fierce scowling look of the eyes, as no language can give an adequate idea of ; but if once seen can never afterwards be mistaken." Ordered warm bath ;

was

^g This cannot be attributed to the bite, but to some temporary indisposition, or irregularity ; perhaps to cold.

was immersed suddenly; universal convulsions, with sense of suffocation followed; breathing gradually recovered, with a noise resembling cough in the croup; "at the same time ejected a considerable quantity of viscid frothy matter." Bath thus proving hurtful was laid aside; a bolus given of Tart. emet. and op. pur. each half a grain; musk six grains; repeat every hour. Also every three hours an injection, asa-fœtida half an ounce, in six ounces of mint water, with two drams of T. op. and two ounces of mucilage of g. arab. Of this mixture add two ounces to four ounces of mutton broth to form the injection. Rub as much as possible of mercurial ointment into the wound, face, neck, and other parts of the body. Evening. Much better; on taking a spoonful of tea recurrence of all former symptoms. 17th. 6, A. M. Last night restless; paroxysms constantly recurring by a recumbent posture; pulse weaker, fluttering, irregular: attempting to walk reeled considerably; constant endeavours to spit out troublesome saliva. "It is remarkable, that he was anxious lest the saliva should fall upon those about him, and frequently desired them to get out of his way, when going to spit." Attempted to eat some bread
and

and butter, spat it out : use the injection as before ; take half a grain crude op. every half hour ; apply blister to nape of neck ; continue merc. oint. 11, A. M. Convulsions recurred violently about throat, and over body : during this snatched at those about him, and uttering a noise like a person under suffocation : duration of fit half an hour ; exhausted ; fell into clammy sweat. 4, P. M. Death.

Treatment may be seen with the symptoms.

Dissection---none mentioned.

CASE XXX.

Mr. Dawfan, a grocer in Westminster, bitten by a dog on one of his thumbs, the 25th of Jan. 1784.^a

The patient had no proof of the dog's madness ; but he judiciously sought for relief, though, it is to be regretted, from an insufficient source.

Prophy-

^a Vide Lond. Med. Journal, vol. 5, p. 85.

Prophylactic. Took directly the Ormskirk powder, and persevered in it in the usual manner; wound soon healed.

Symptoms. March 8th. (42 days from bite) felt for first time tingling pain in cicatrix; arm stiff and uneasy; concluded it to be rheumatism. Next day (9th) noon. Difficult deglutition. 11th, in the afternoon. Death.

These are all the particulars narrated; but we have reason, from reviewing other cases, to conclude, that had the detail been afforded the similarity between it and them would have been sufficiently marked.

Neither treatment nor dissection is mentioned.

CASE XXXI.

Mr. Babington's patient, Abraham Palmer, a boy 14 years of age, bitten by a dog on the right hand, June 9, 1783.ⁱ

The patient was brought to the hospital about an hour after the accident. Uncertainty of the dog's madness.

Pro-

ⁱ Vide Med. Communicat. vol. 1, page 215.

Prophylactic. No excision, no caustic; warm miik and water only ordered as a fomentation to hand and arm: merc. oint. to a dram daily rubbed in on the same arm: dress the wound with common cerate.

Symptoms. July 17, returned to the hospital; something remarkable in his countenance, and different from health; great pain in the bitten arm; unable to lift it to his head. His friends applied, not suspecting Hydrophobia, for relief towards this pain: unable to swallow some mint water; became convulsed at the attempt, sobbing, and suddenly throwing it from him. Pain of arm had already continued two days; no apparent inflammation, no discoverable swelling of axillary glands: some tightness of breast, as appeared from speech and breathing: thirst considerable; pulse full, and moderately quick; tongue clean and moist: perfectly sensible; nor complained of lassitude, but walked as usual. Eight o'clock, evening. Spasms of scrobiculus cordis increased; pain of arm ceased; perfectly sensible; "had no dislike to the open air, but on the contrary had a great desire to be in it, and said he found himself more comfortable when allowed to sit in the yard, than when confined

to his room:" sensibility of touch augmented; felt horror and shuddering on wetting his hands; thirst great; salival discharge not yet considerable. Spasms about the diaphragm very troublesome, and appeared to the boy to depend on wind in the stomach, which if he could pass upwards said, would make him well. No sleep; he could not sleep, he said, for the buzzing of the flies: said his right eye was drawn in towards his nose, and that he was blind of it for near a quarter of an hour. 18th, in the morning. Countenance marked with great anxiety; pulse quick and hard; thirst great; uncommon eagerness in all his actions; face much flushed; eyes staring and watery; made frequent efforts to vomit, at which times he was very much agitated, and brought up a viscid, ropy kind of saliva: flies, as he thought, very troublesome to him. "Why don't you kill these flies?" he would cry, with a great degree of impatience; and then he would strike at them with his hand, and would often shrink in the bed, as if he were afraid of their getting to his face: still rational; requested to be carried into the open air in the yard; repeatedly vomited up medicines given him soon after taking them;

ag-

aggravation of all the symptoms; talked wildly; complained of sickness at stomach; convulsions tossing him from one side of the bed to the other. Attempted to swallow some bread and butter ineffectually; forcibly ejected it, "with a quantity of glairy fluid he had been vomiting all the morning." Convulsions still increased---Death. This took place "with a countenance as much opposed to that of the minute before, as it is possible to conceive, the scene being closed with several of the most beautiful smiles."

Treatment: A bolus of musk and cinnabar every two hours, 15 grains each, with a grain of opium: kept down two doses, threw up other two: musk increased to 20 grains; warm pediluvium; blister to scrob. cordis; a laxative clyster: by next morning had taken seven grains of opium, without sleep; V.S. to 20 ounces to no advantage: opium ordered to be increased till it should produce some effect; head to be shaved, and bathed with warm vinegar: warm bath.

Dissection. Nothing on the external body remarkable.

Head

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Head---Vessels of D. and P. mater more turgid with blood than in health. Blood in sinuses fluid.

Brain---sound.

No appearance of disease in mouth, pharynx, œsophagus.

Trifling inflammatory appearance on epiglottis, and a little way within the trachea; some glairy fluid in this part.

Heart---sound; blood in it small in quantity, but fluid.

Lungs---Blood accumulated here; more in the right than left side. Pleura natural.

Diaphragm---Vessels on superior side somewhat turgid.

Liver---natural. Gall bladder nearly full of very dark-coloured bile.

Stomach----free from disease: contained about half a pint of glairy matter tinged with cinnabar. A diminution of size in two or three parts of the small intestines.

Bladder---contained some urine. Ureters healthy; likewise kidneys and abdominal viscera.

No notice is taken of the distance from death when this inspection was made.

CASE

CASE XXXII.

*By M. Poncelin, Surgeon, at Aubreville, near
Clermont.^k*

The ravages committed by a mad wolf in his neighbourhood are enumerated by him. The accidents happened about 1782. A shepherd at length killed the animal, and fell a sacrifice himself afterwards to Hydrophobia. This poor man had both the frontal and occipital muscles in a great measure destroyed: the right eye-brow torn down over the eye; the lower lip carried away; the jaw laid bare; five teeth broken; the right cheek bitten in two; a wound on the sternum, which laid it bare; another, two inches long, in the fore arm, reaching to the bone; a third somewhat flighter, in the right leg.

Prophylactic. Mercurial frictions to the wounds for 30 days; wounds healed: was dismissed seemingly well.

Symp-

^k Vide Journal de Bouillon.

Symptoms. Two days after dismissal from hospital felt sense of suffocation; slight headache; convulsions; aversion to food of every kind; aversion to light, and any thing of a white colour: death 44 hours after.

Treatment---None.

Dissection---None made.

CASE XXXIII.

At Aldersgate General Dispensary: a boy 5 years old, bitten by a dog in the cheek, about 1782.¹

This accident happened from a dog which appears to have been in an early stage of the disease. This was a strange dog which the child found accidentally in the street, and was *familiarly* playing with it when he was bitten. The animal immediately ran away, and was never afterwards heard of. The child remained well for two months, then became hydrophobic.

Symp-

¹ Vide Lond. Med. Journal, vol. 3, p. 313.

Symptoms. When the physician first saw the child, he found him affected with difficult deglutition; greatly affected likewise by the cold air; aversion to every thing liquid. Next day death.

These are all the particulars mentioned of the case. Not having access to the dispensary books, I cannot here more particularly detail it.

CASE XXXIV..

In Middlesex Hospital, a middle aged man, bitten by a dog in the cheek, on Dec. 15, 1781.^m

This was a severe accident in respect to the extent of the wound. It reached from the lower eye-lid to the left corner of the mouth.

Prophylactic. In this instance likewise no suspicion of madness in the animal was entertained. Nothing therefore was done to the wound as preventive. Common dressings were thought sufficient applications to promote

^m Vide Lond. Med. Journal, vol. 3, p. 92.

mote cicatrification. In three weeks the wound was perfectly healed, and he was discharged the hospital. Next day (Jan. 9) he returned, labouring under the disease, being 25 days from the accident.

Symptoms. This morning swallowing a little tea first discovered difficulty in the attempt; was struck with apprehension; seemed conscious of madness, cautioning his wife to beware lest he should injure her. Re-inflammation on the wounded part; pain and uneasiness in it;^o great agitation; tongue white; pulse full, and considerably quickened; sight of water in this instance produced not the least uneasiness throughout the disease, an occurrence, though rare, which has taken place in a few other cases. Deglutition extremely difficult: on attempting "to drink, he was immediately seized with spasms of the throat, and with violent efforts to vomit." During the whole of this day (Jan. 9) was rational, giving pertinent answers to questions asked him: watchfulness throughout the night; pulse
be-

^o This fact is proved by the patient's frequently putting his hand to the check, not only when he came into the hospital, but during the course of the disease, when free from convulsions.

becoming smaller and quicker; salival discharge increased; ropy and troublesome. 10th. Difficulty of deglutition somewhat less; swallowed some liquid from spout of tea-pot: this short interval succeeded by severe exacerbations; became violent; was tied down to bed. 3, P. M. Death.

Treatment. Mercurial ointment rubbed into the wounded cheek; musk, cinnabar, &c. ordered.

Dissection. Tongue and fauces white, not dry: muscles of the tongue sound; submaxillary glands somewhat enlarged.^p

Œsophagus---slightly inflamed; contiguous lymphatic glands larger than common.

Stomach---Large quantity of yellowish bile in it, and in duodenum.

Other abdominal viscera natural.

Lungs---adhering to different parts of pleura, and somewhat fuller of blood than usual.

Heart---Ventricles and contiguous vessels quite empty: *liquor pericardii* very small in quantity.

Brain

^p This is a very uncommon occurrence. Disease has not been discovered here,

Brain---Dura mater seemed contracted, adhering to pia mater, near the longitudinal sinus. A small quantity of watery fluid collected between D. and P. mater at posterior part of brain,

Sinuses---somewhat more turgid than usual. The quantity of water in ventricles not more than usual.



CASE XXXV.

Dr. Berkenhout's patient, a young man, bitten by one of his father's hounds on the arm, six weeks before the disease commenced.^a

We are not told where, or when this accident took place. The case is published in 1783. Dr. B. not called till the disease was far advanced. A day or two before this, pain in bitten arm, extending towards the shoulder. At 10, A. M. on Dr. B.'s first visit, difficult deglutition: retained his senses throughout

^a Vide Berkenhout on Bite of Mad Dog.

out the day; no propensity to bite; restlessness hourly increased, 11, P.M. Death.

Prophylactic---None mentioned.

Treatment. Juice of rib-wort had been administered (the specific of the place) from the time of the attack till the arrival of Dr. B. Ordered now warm bath, continued in it an hour: merc. oint. was rubbed into each arm: take op. crude one grain every hour.

Dissection---None made.

CASE XXXVI.

Mr. Bathie's patient, James Patton, aged 14, bitten in the right hand by a dog, on the 18th of Nov. 1774.°

This happened in Fifeshire. The dog showed to the lad on his going up to him, the usual marks of tameness and affection peculiar to this animal. He fawned on him; he ate bread which the boy gave him. Two men being present, the one desired the lad to tie a cord

° Vide Med. Comment. D. i. vol. 3, p. 290.

cord round his neck to secure him (he was a strange dog); the other cried out to him to desist, being suspicious from something particular observable in the eye. It appeared dull; it was also inflamed. The boy, inattentive to the caution, in the act of tying the cord was bitten. Wound bled freely. The animal at this moment seems to have suffered a paroxysm; for he flew at the lad's dog, and bit him; then he betook himself to flight. About five days after he was killed in a different part of the country, as a mad dog, where no knowledge of this accident had reached.^p

Boy's hand and arm swelled greatly; became inflamed up to the shoulder, proceeding doubtless from the tendon being wounded, though the bite was small, and close by the root of the ring finger. Boy brought to Mr. Bathie on third day after, on account of swelling of arm; no suspicion of dog. Wound then scabbed over; circumstances related excited Mr. B.'s suspicion; but nothing done to the wound, through an idea of its being too late,

^p The reader is requested to attend to the circumstance of early capability in the dog to communicate infection, and to his fawning and taking food.

late, and of the poison having already entered the habit.

Prophylactic. Purged with calomel every third day for four times; wound fomented with emollient decoction; keep up discharge by basilicon and precipitate; remained well for about eleven weeks.

Symptoms. Feb. 9, 1775, was indisposed; dull and heavy for some days before; attributed to vexation from his companions improperly teasing him with stories of mad dogs, and dreadful deaths. This day "universal lassitude, sickness, loathing of food, and a slight head-ach." Kept at work to-day, these not being severe: concealed his illness. 10th. Still concealed it, and went to plough; could not continue at work: his master, ignorant of his illness, chid him as lazy: "he sat down and complained of a pain between the shoulder and elbow of his right arm, a disorder of his throat, and a head-ach." Went home; attempted to drink, but could not: thirst considerable; walked this evening a mile, with great difficulty and fatigue: seized soon after with shivering; complained of pain of throat; pain in arm continued; examined; found the skin of a yellowish hue from elbow to shoulder

der-top, "having both the appearance and feel of that of a dead person:" restless this night. 11th. Symptoms worse; deglutition rendered impossible; attempts threatening instant suffocation; attempts to eat equally dreaded. Evening. Pain of arm continues; pain at pit of stomach; great uneasiness at throat: attacked now with cold and shivering, succeeded by hot fit, and sweat: pain of arm no longer troublesome; slept after paroxysm two hours; about midnight delirium; struck at his mother, thinking her a stranger intending him mischief; but when reasoned with on the impropriety, he became sensible, and sorry for it. From this time appeared unconcerned; spoke only when spoken to; looked timid, alarmed at noise, and luminous objects, subfultus tendinum; delirium, yet sensible and collected when spoken to; when undisturbed would fall into reverie; reason returned when attention was arrested, in the midst of his highest phrenzy: shrunk back from sight of fire, or lighted candle; felt oppressed by pressure of bed-clothes. 12th. Mr. B. first saw him; he was then "lying on his back, rolling his eyes without intermission; and he did not stir out of that position until I (Mr. B.) spoke
to

to him." Being spoke to, he answered hastily; rose on his knees; passed some urine in a pot, of a greenish colour, turning whitish when cold: since febrile paroxysm; a desire to pass urine frequently; always of same colour, and small in quantity: tongue now covered with thin white fur; great desire to drink; skin moist, with considerable heat; pulse full, and from 125 to 130; pain of head; oppression from heat of stomach, and inability to drink. "He had also an inclination to vomit, but was afraid to do so for the obstruction in his throat." Tone of voice unaltered from health; spoke to Mr. B. at this time rationally; cicatrix of a bluish hue, but no ulceration. Mr. B. proposed V. S. he started up, held out his arm, adding that he would do whatever bidden for recovery: attempted to drink; let fall the cup; started on his feet; grasped his throat, remaining about a minute in a state of suffocation, till the spasm it occasioned gradually relaxed; then laid down: convulsions of face, throat, breast, with deep sobbing and noise; symptoms aggravated; became furious, fancying his friends conspiring against his life; was rational at intervals to the last; the paroxysm strong, in which three or four men could

could scarcely hold him; at length strength exhausted---death. It is observed that the lad, snatching at a bit of bread held out to him by his uncle, bit his thumb. Mr. B. adds, that the man had resolution and prudence to cut out the piece, and so remains free. The case likewise clearly points out to us the fear and apprehension entertained by those about him, for their own safety. A needless apprehension.

Treatment. Blood let to a pound last day of disease; was thick, long of separating; serum somewhat viscid and greenish; gave a grain of tartarised antimony: an hour after "he vomited a great quantity of green viscid matter." Ordered an emollient clyster every hour; not given from fear in the attendants; a blister applied to the throat.

Dissection----None made.

CASE XXXVII.

Dr. Fothergill's patient, Mr. Bellamy, aged 40, bitten by a cat in the leg, Feb. 1774.^q

This

^q Vide Lond. Med. Obs. vol. 5, page 195.

This happened in Holborn, London.

Prophylactic. 15th. Took the Ormskirk medicine, according to printed directions. About April 15, was seized with a rheumatism in knee: pumped cold water on it. June 7. Still affected with the same: took some alterative pills for it; continued them a week; then felt titillation of the urethra; contraction of scrotum; *emissio feminis involuntaria*: attributed this to medicine.

Symptoms. June 15th. A restless night. 16th. Impeded deglutition: head-ach, sweat, and watchfulness last night: no marks of inflammation on cicatrix; thirst; aspect various; eye penetrating; pulse 90, frequently changing from hard to soft, and vice versa: tongue dry; urine scanty; scrotum continues much contracted; *emissio feminis* less frequent. At this time had no recollection of his accident, nor had it occurred to him; hence the symptoms not attributable to fear. Attempting this evening to swallow, muscles of deglutition convulsed: countenance pale; great agitation; thirst increased; tongue white, yet moist: constant hawking up of tough phlegm; heat of body moderate; pulse quick, hard, and irregular; strong palpitations of heart;

heart; rational as in health. 17th. Morning. Symptoms all increased last night; no rest whatever; saliva more copious, but more fluid; tongue white and moist, but foul; pulse much as before; hands tending to coldness; contractio scroti, &c. gone; sensibility of touch morbidly increased; delirium at night, but offered no violence. Death at half past twelve this night.

Treatment. First day of disease, V. S. to six ounces; a bolus of musk 10 grains, cinabar 20 grains, every four hours: food, whatever he inclined to. Five in the evening. Blood drawn in the morning shows slight marks of inflammation; crassamentum firm; serum remarkably yellow. Clyster of pulv. doveri; warm bath; mercurial unction on legs and thighs. Second morning. Relieved by the bath; bled copiously standing; warm bath repeated; extr. op. two grains every hour. Five o'clock, evening. Relieved again by the bath; a temporary relief, for he died this night.

CASE

kerchief to his mouth to prevent its entrance ; horror at the sight of fluids ; suffered greatly in passing little puddles of water, in his way to the infirmary : perfectly rational ; pulse soft and unequal ; respiration remaining free ; heat moderate ; no thirst ; eyes fierce, with a mixed timidity, and with something peculiar, not easily definable, impressing the doctor with uneasiness at viewing them ; their colour changed ; pupil dilated, and iris of an orange hue. When he spoke, it was in a tone of plaintiveness ; no propensity to bite ; water offered produced hideous moaning ; risus sardonius with convulsions ; and he struck forcibly the pit of the stomach ; lying on his back produced the same sensations with cold air, causing him suddenly to start up, and bend forward for ease ; deglutition performed with difficulty, unless the substance was thrust far into the throat ; this removed the impediment ; sensibility to touch morbidly acute ; an embrocation to the external fauces produced convulsions ; passed urine of a lemon colour easily ; could view it without horror in a black earthen pot ; in a glass the sight produced instant convulsions ; difficulty of deglutition ; 2, P. M. this greatly augmented ; boiling heat of
sto-

stomach mitigated ; urine forcibly expelled in the paroxysm ; erectio penis constant. 5 P.M. symptoms worse ; muttered incoherently ; but, on being reproved, and his attention arrested, was collected and rational ; craved much for beer, but attempts to swallow induced convulsions ; covering the liquor, and sucking through a quill, tried unsuccessfully.^t 9, P.M. Every thing worse ; highly restless ; talkative, attempted to get out of bed ; eyes fiercer ; incessantly craving drink, but not unruly ; incessant plucking now at the bed-cloaths. 11, P.M. Worse ; perturbation and rambling incessant, yet rational when spoken to ; frequent regurgitations from stomach, though not actual vomiting : salival discharge more viscid, and very troublesome ; all his complaints aggravated by the improper conduct of his attendants, who, believing in the vulgar opinion of the infectious nature of the disease in man, and in other animals, were attempting to suffocate him in the bed clothes, from which his more intelligent and humane physician relieved him, with the severity of just rebukes to the perpetrators : though sensible

^t Cælius Aurelianus recommends similar stratagems. Vide lib. iii. cap. 16.

sible of the ill treatment received, yet mild and obedient to Dr. V.'s persuasions ; nor was disposed to violence, notwithstanding suspicion of his attendants, whose fears for self preservation had overcome their humanity. 17th. 2, A. M. Complained of an offensive smell in cicatrix, yet no change had taken place in it ; others could feel no fœtor from the part : eyes now had lost their fierceness ; were more fixed ; hands and feet cold ; pulse irregular ; violent convulsions, with copious discharge of saliva ; spasmus cynicus : " odd convulsive motion in the muscles of the face, and the strange contrariety which took place in the action of these produced the most horrid assemblage of features that can well be conceived." Ceased now to call for drink ; perpetually calling for food. Death.

Treatment. Nov. 16. On being brought to the hospital was bled ; blood firm in texture, with a due proportion of serum ; and appeared healthy : bolus of a scruple of musk and extr. op. two grains. Dr. V. was unwilling, in this distressing complaint, to trust to musk and opium ; he therefore directed a bolus of musk fifteen grains, turpith mineral one grain, extr. op. five grains, every three hours ;
also

also an ounce of mercurial ointment to be rubbed on the cervical vertebræ; next an embrocation of T. op. two ounces, acet. saturnin. half an ounce. Unable to bear this application, it was changed for extr. op. half an ounce, camphor dissolved in spirits of wine three drams, confect. damocr. six drams, made into a plaister for the throat, which the patient bore well. 9, P.M. A clyster of mutton broth, with T. op. half an ounce. Two hours after, opium to a larger quantity was given ineffectually, with a view to stop excessive restlessness.

Dissection. Abdominal muscles natural in appearance and colour, notwithstanding the many blows which the patient had given himself during his paroxysms. Abdominal viscera also natural.

Stomach---Marks of inflammation, with a small quantity of fluid mixed with the medicines.

Liver free from disease; in gall bladder some air; small and great intestines empty; no fæces in rectum.

Thoracic viscera sound.

Diaphragm---healthy.

Œsophagus opened longitudinally; no vestige of inflammation in it.

Velum

Velum pendulum palati, pharynx, larynx, glottis, without morbid marks.

Brain not examined.

CASE XXXIX.

Dr. Vaughan's second patient, a farmer, aged 25, bitten by a dog in the fore finger of left hand, in Sep. 1775.^u

Two years after the last patient's death another, under the same disease, is brought to the Leicester Infirmary.

Prophylactic. The superstitious notion which long prevailed of the disease being influenced by the full and change of the moon, induced this young man, a week after the bite, the moon then being at the full, to repair to the sea. Bathed the common time recommended; drinking also on the spot sufficient to purge him briskly. Wound cicatrised while at the sea; no trouble from it afterwards.

Symptoms. June 6 following. First felt a pain in bitten hand and arm; thought it rheumatism;

^u Vide Cases and Observat. on Hydroph.

malesin; bathed for it this evening in the river: no inconvenience from the water. 7th. Last night restless; this morning sickness, but not vomiting; yet went to work: swallowed tea with ease at breakfast; thirst through the day troublesome; quenched it without inconvenience. This "evening he was seized with a vomiting, which continued the whole night, and until eleven o'clock next day (8th), every thing coming up as soon as taken." Liquids, at this time, could not be longer borne; sensation of heat ascending from pit of stomach to fauces; salival discharge viscid, copious, troublesome, constantly spitting it out in large white flakes with force: frequent starting from his chair, for he could not lie down: sense of suffocation, with great pain at scrob. cordis; desirous of cold air, but it constantly renewed his distress; sight of water excited convulsions; risus sardonius: eyes expressed fierceness, with fear and timidity peculiar to Hydrophobia: pupil greatly dilated, yet colour of iris not changed: skin cool; pulse feeble; frequent eructations; urine passed with ease; respiration free in absence of cold air, or of paroxysm: no pain, except at pit of stomach: was sensible of his situation, and of aggravation

tion

tion of his complaints ; objected not to warm bath ; no change in cicatrix whatever during disease ; symptoms rapidly aggravated. Ten this evening, death.

Treatment. Warm bath ; purgative injection ; repetition, without the patient's objecting to oil and T. op. merc. oint. ordered to be rubbed on fore part of throat to four drams ; cover the part with empl. è cymino, with extr. op. half an ounce. Let friction be used to pit of stomach, with embrocation of half an ounce of spt. sal. ammon. ten drams olive oil, six drams oil of amber, and ten drams T. op. also merc. oint. two ounces upon shoulders and back. To raise quick salivation, let fumes of cinnabar be taken into the mouth ; also take every four hours a bolus of 15 grains of musk, three grains of merc. emet. flav. four grains of extr. op.

Dissection---None made.

CASE XL.

Dr. Vaughan's third patient, a boy 8 years of age, bitten by a cat on the wrist, about the 29th of July, 1778.*

This boy fell ill about a month after the accident. Aug. 29, Dr. V. called to visit him.

Symptoms. Day before complained of pain in cicatrix, stretching up the arm, and to temple of same side: soon after deglutition impeded: this day worse, but Dr. V. did not find eyes fierce, as in his other patients, but the boy looked timid and dejected: sobbed deeply at the sight of water, turning away with perturbation: convulsions if any thing touched his external fauces; sighed deeply, yet respiration free, except in paroxysm: pulse feeble, irregular, intermitting: no thirst; no preternatural heat; intellects clear; answered rationally, "and whatever he wanted to obtain, whether to have some disagreeable object removed, or some request granted, it was implored in the most piteous manner." Went
into

* Vide Cases and Observat. on Hydroph.

into the warm bath, but felt uneasy at touch of water, and more so when it touched any fresh surface of his body. 10, P. M. Sighed more; started up in bed. 12, P. M. Restless; face flushed; frequent startings; complained of weight of bed clothes; unable to lie under them. 30th. 1, A. M. Talked frequently. 3, A. M. Restlessness increased; eyes fierce; sighed deeply; talked much; aggravation of every symptom; complained of cold, but could not bear the bed clothes: intellectual faculties seemed quickened by disease; distress about pit of stomach, like the two former patients, but descended down the recti muscles. 11, A. M. Every thing worse notwithstanding the remedies used. 4, P. M. More ungovernable, but no inclination to bite: talked incoherently, and had, for the three last hours, walked about incessantly: pulse not to be numbered, through quickness. 9, P. M. Pulse extremely feeble; complained of heat, though to the touch cold and clammy. 31st. 1, A. M. Eyes enlarged, with a livid circle round: upper lip covered with frothy mucus: would lie still for a few minutes, then suddenly plunge with his feet: breathing irregular, laborious: speech faltering. 2, A. M. Death.

Treat-

Treatment. Warm bath ; temporary relief ; remained in it near 45 minutes : on quitting bath a plaister to the throat, of which facc. saturn. was the basis. Dr. V. changing the plan adopted in his former cases, used the metalline antispasmodics : flowers of zinc one grain, cuprum ammoniacale half a grain, musk ten grains ; make into two pills, with a little syrup : take them every three or four hours. Rub on shoulders and back a liniment of strong mercurial ointment, and oil of amber, each three drams : inject a clyster of five ounces of fresh broth, with T. op. thirty drops. Also prepare a medicated atmosphere, by burning gum ammoniac in the room. 12, P. M. Repeat the warm bath ; inject a clyster, with a dram of T. op. continue merc. liniment : remained in bath near two hours, with some alleviation of distress : pills increased in dose, containing now two grains of cupr. ammon. two of extr. op. three grains of flor. zinc. with ten grains of asafœtida : also inject a dram of asafœtida, dissolved with a dram of T. op. “ The above pills, though repeated every four hours, afforded not the smallest relief ; nor did they show the *least action* upon the frame.” 2, A. M. Warm bath of milk and water ;
could

could remain in it only 15 minutes: a purgative injection. Dr. V. determined now to try the effect of sudden immersion, imitating the case which Van Helmont had affirmed to have been successful, viz. the old man dipped at Sluys. "A large tub of cold water, well saturated with common salt, was made ready, into which this patient was suddenly plunged over head and ears, and there held until he ceased to struggle: he was then taken out, and the same operation again repeated, until he became so quiet, that I was apprehensive a total extinction of life would actually take place. He was then wrapt in a blanket, and put to bed:" remained quiet two hours, but neither horror of fluids, nor impeded deglutition abated. 8, P.M. Swallowed some pills of camphor, nitre, and opium.

Dissection. Nothing observable externally: stomach and intestines healthy: in the latter some air; some fluid in the former, chiefly of medicine.

Liver---healthy; gall bladder full of bile; diaphragm healthy; lungs healthy.

Heart, and large vessels not preternaturally distended with blood.

(Eso-

Œsophagus---No marks of disease ; it was divided longitudinally. Back part of the fauces without morbid appearance.

Brain---Nothing unusual.

About 48 hours terminated this complaint.

CASE XLI.

Dr. Dickson's first patient, John Brown, aged 13, bitten on the right cheek and shoulder by a dog, in the beginning of Jan. 1767.*

A considerable number of persons were bitten at the same time in Whitechapel road, of whom this and the two following cases proved fatal.

Prophylactic. Lad taken in to London Hospital immediately after bite ; wounds well scarified, and suffered to bleed freely ; mercurial ointment rubbed on the parts for ten days ; no ptyalism ; left the hospital after three weeks ; had taken three purges of salts. Continued well till April 30.

Symp-

* Vide Lond. Med. Obs. & Enq. vol. 3, p. 356.

Symptoms. This day, while at play with other lads, felt pain in right cheek: this night cramp, and pain of cheek worse: no sleep. May 1. Breakfast as usual. Evening. Could neither eat nor drink; breathing difficult; no sleep this night; no food; no drink from this till the 4th, at 1. P. M. when Dr. D. first saw him: had now a wild frightened stare; clapped his hand frequently to cicatrix on cheek; same to throat; hung his chin on his breast; spat much and frequently a frothy saliva; complained of the cold air on cheek and throat, producing pain: considerable mucus from nostrils; breathing quick, laborious; pulse soft, not frequent; heat natural; sensation of ball in throat without pain; rational, without apprehensions of danger, till three days before, when he heard of a neighbour's death from this disease, whom he knew to have been bitten at the same time with himself: a pain then instantly struck the cheek bitten. Here it is apparent that fear was the exciting cause. Attempted to drink water ineffectually; coaxed to come to the warm bath; proceeded to the door, but on feeling the cold air, resolution forsook him: hurried down two pair of stairs with great speed, resolving to bathe, but was obliged

obliged to be carried to the bath: a temporary relief from it; spasms of throat ceasing; in the bath afraid of suffocation; eructations while in the warm water, with some relief; remained in bath 25 minutes; was put to bed in blankets: sweated copiously for half an hour; easy under it; recurrence now of spasms of throat; great restlessness; complained of hunger; ate an apple greedily, with a bit of bread and beef cut small: "in less than half an hour afterwards he was seized with a considerable vomiting, and what he threw up was of a very frothy nature, and colourless:" some hours after, vomiting recurred; aggravation of symptoms; continued sensible till a little before fatal termination; for a quarter of an hour delirium; kept constantly calling out to remove the dog; death. This took place at eleven the same evening; restlessness during the last hours inconceivably great: "it was not in the power of those who attended him to keep the bed clothes upon him, though he was continually complaining of the cold air giving him the greatest pain in his cheek and throat, which made it at last necessary to have him strapped down. He often cried out, that the doors of the ward were open when they
were

were shut ; and, on account of cold, wanted the curtains to be drawn close ; nor did it appear that light any-wise affected him." Thirst intense throughout, but unable to drink, though frequently making the attempt : " his spitting of frothy matter increased so much, that in spite of all the care possible, his bed was exceedingly wetted by it ; and the mucous discharge from his nostrils likewise considerable." No attempts to bite ; pulse weak, not to be felt for some hours before death : spasms greatly affecting muscles of breast, as well as throat. " In a few hours after his death a considerable degree of blackness was observed about his private parts, his throat, and the shoulder where he was bitten (which had no ulceration upon it) and likewise about the eyes, which were quite sunk in the orbits, and evidently, to me, diminished in their size, attended with an opacity of the *cornea*, and muddiness of the humours, which I never before had seen in the eyes of any dead person."

Treatment. *Warm bath : people of the ward so timid, lest they should receive infection, that they could with difficulty be prevailed on*
to

to come near the patient, or lend their assistance." Ordered some mistur. spermaceti cum T. op. Add to the mixture T. op. 20 drops; give every hour: or instead, a grain of extr. op. clyster of broth to be injected with T. op. a dram; repeat it every two hours: foment neck and throat, and if possible apply an emollient poultice: take pill of extr. op. two grains, and repeat it. On recurrence of vomiting, clyster, with T. op. a dram and a half.

Dissection---None made.

CASE XLII.

Dr. Dickson's second example of disease: a gardener's servant bitten on the arm at the same time with John Brown.*

This patient the Doctor did not see, but obtained his information from the gardener whom the patient served.

Prophylactic. Wound soon healed; and he applied to a person at Walthamstow who

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* Vide p. 142 for a refutation of this ill-grounded notion.

* Vide loc. supra citat.

possessed an *infallible* remedy, to which he trusted. “ He continued in good health, and without any apprehensions of danger, till Tuesday night, April 28, when, at a public house, after having drank a share of several pots of beer, he found, all at once, an impossibility of swallowing. He had filled his mouth with beer, but not being able to get down a single drop, he spurted it out with great force, and cried out that he was a dead man. From this time he could never be prevailed upon to take any thing into his mouth. He kept continually spitting a frothy matter, of which he desired those about him to *beware*: was exceedingly restless; had no sleep; but remained perfectly sensible to his death, on Friday noon, May 1.”



CASE XLIII.

Dr. Dickson's third example of disease:
----- Bean, aged 69, bitten on the shoulder
by the same dog, on the same day.^y

The particulars of this case were furnished by the apothecary of the hospital, who carefully collected them.

This

^y Vide loc. nuper citat.

This man came to the hospital after the accident, and remained in it three weeks; was well at leaving the house; but five days after, “ he was seized with a pain in the shoulder where the dog had bitten him, which extended to his throat. His breathing became very short. Next morning he drank some tea with difficulty; was delirious from this to the Thursday se’nnight following, when he died. He spat much frothy matter the whole time, and neither ate nor drank any thing since the tea already mentioned, the day after he was seized, till ten minutes before his death, when he drank a cup full of cold tea. He had no sleep during all his illness, and was blind the last four days. The night he was bitten there was a great discharge of blood from the wounded parts.”

CASE XLIV.

Dr. Raymond's patient, ----- Boyer, aged 25, bitten by a mad dog in the leg, on the 19th July 1765.^z

This

^a Vide Lond. Med. Obs. & Enq. vol. 5, App.

This happened near Marseilles : wound pretty large ; bled freely ; not lacerated : leg for some time previously odematous and swelled : in other leg two ulcers ; patient cahectic.

Prophylactic. Part cauterized some hours after : mercurial ointment rubbed in round it ; and plaister of same applied over wound ; continued so dressed till cicatrification. 2d day. Bolus of 4 grains turp. mineral ; 8 grains camphor ; vomited and purged briskly ; salivation now came on. 3d day. Rub bitten leg with merc. oint. In the space of a month five frictions to both legs ; each of three drams of merc. oint. During this month same bolus five times ; salivation slightly to 40th day. On third day after bite took Cobb's powder ; it vomited him briskly ; repeated seven or eight times during the month with same effect. During first week, gave also, four times, a dram of fresh-gathered and powdered anagallis flore puniceo. 41st. day. Turp. bol. for seventh time : succeeding three days bathed in sea.

Symptoms. 74th day. Slight difficulty of swallowing. Evening. Could not swallow water ; slight uneasy sensations for some days past ; tightness in œsophagus ; difficult respiration. Proceeding this day to Marseilles, and passing
a ri-

a river, was seized with horror at sight of water. 8, P. M. Dr. Raymond visited him; found his countenance wild; eyes fierce, but mind composed: talked incessantly, with great rapidity: spoke kindly, but with great volubility, to his brother, repeating these tendernesses: complained of burning heat; was very restless, shifting in bed from place to place with extraordinary quickness: was offered liquor to drink; took the glass, sighed deep, and let it fall: raised himself sometimes in bed, sending forth furious and horrible shrieks, yet admonished the attendants not to be afraid of him: thanked God he had no inclination for biting; every action rapidly performed, and with uncommon vivacity. "Vomited now and then, with violent efforts, a glairy matter, little in quantity, and which made him shudder." Salival discharge. 76th day. Death. Mouth at this time covered with saliva, and countenance bloated: pulse quiet during disease. Dr. R. thinks the cautery not properly executed, otherwise the event would have been more happy. It was not done in his presence.

Treat-

Treatment. On 74th day twice bled in arm and twice in foot: pill of opium ordered.

Diffection---None made.



CASE XLV.

Dr. Munckley's patient, a man 36 years of age, bitten by a little favourite dog on the hand, also on the cheek, on the 11th of July, 1760.^a

The place where this happened is not mentioned, and delicacy likewise has concealed the patient's name.

Prophylactic. On the accident taking place the patient, immediately sent for his physician. V.S. to ten ounces ordered; bathing in the sea recommended, which was complied with; continued it ten days; took no medicine, trusting to its virtues. Continued well about a month, though with the appearance of melancholy and thoughtfulness in his look.

Symp-

^a Vide Med. Transf. vol. 2, p. 46.

Symptoms. Aug. 19. Some difficulty of deglutition; much disturbed this day and through the night. 20th. Dr. M. consulted; little heat on the skin; pulse low, not much quicker than in health: vessels of the eyes turgid; tongue parched and dry, not white: Hydrophobia now fully formed. 21st. 10, A. M. Slept quietly last night; towards morning tossed much; this increased rapidly; his friends could no longer stay with him. "On entering the chamber we found him sitting up in bed, with an attendant on each side, incessantly tossing his arms about; turning towards the physicians; baring one of his arms, and striking it with the other, he called out vehemently to be let blood." Redness of eyes increased; horror and despair of countenance; spitting increased; this done with rapidity, and with force; now in the bed, now in the room, now in handkerchiefs for the purpose: phlegm yellowish, tough; hawked up with great difficulty: this done with a noise, and considerable alteration in the tone of voice. Is this what has been called barking? On opening his mouth it was seen adhering to the fauces: no foam about the mouth; perfectly rational; knew every body around; offered no violence, nor had

had the attendants any apprehensions from him: thyroid cartilage more than commonly protuberant, especially the upper part, gently stroking of which, by one of his attendants, gave momentary relief; attendant, during the night, with the corner of an handkerchief, put his finger into his mouth, *and roped out from time to time the tough mucus*. On water being poured from one basin to another before him, it excited the greatest distress and horror. To the person thus employed he gave the epithet of *villain*. It excited convulsions, and caused him to dash himself against the head of the bed, as if endeavouring to escape from the sight. Death, between one and two of the same afternoon.

Treatment---None attempted.

CASE XLVI.

Dr. Rutherford's patient, George Pollock, 45 years of age, bitten by a dog on the left leg, in the end of Nov. 1749,^b

This

^b Vid. Mem. Lond. Med. Soc. vol. 1. p. 243, communicated by Dr. James Johnstone, Worcester.

This accident happened in Edinburgh; thirty hours after which the patient put himself under the care of Dr. Dundas of that city, who enjoined the following.

Prophylactic. Wounds washed with common spirits; next day V. S. in right arm to 16 ounces; take twice a day, for two days, of native and factitious cinnabar, each twenty-four grains; musk fifteen grains. Then take for four mornings a dram and half of pulv. antilyssi: use the cold bath forty days successively; dress fores with merc. oint. patient bathed part of this time only, and in part used yellow basilicon to the fores in place of merc. oint. fores kept open a month, or upwards: fores not painful; never discharged pus, but only sanies; remained well till March 3, 1750.

Symptoms. This day affected with pain in loins, os sacrum, thighs, and false ribs, with heat, and sharp pain of urine. 4th. Morning. Pain in abdomen; impeded deglutition. 5th. Admitted into the Royal Infirmary; put under the care of Dr. Rutherford, clinical professor: patient now distressed from impediment to deglutition; attempt producing deep sighing, with horror of countenance, and spasms threatening

ening suffocation, yet complained of no pain at other times : swallows bread or solids with little difficulty ; symptoms increasing ; “ said he would willingly drink, did not something, which he cannot describe, render the *thought* and *sight* of liquids disagreeable : ” no sleep for 48 hours ; tongue white and dry ; urine small in quantity, but high coloured ; belly regular ; pulse feverish, hard ; little altered by attempts to swallow ; bled this morning : the antiphlogistic regimen being at this time the prevalent practice, professor R. again ordered V. S. gradually to sixty-six ounces ; sick from this evacuation ; pulse somewhat smaller and slower, yet less than from this quantity might have been expected : blood not fizy ; serum abundant ; crassamentum florid, but loose ; head shaved, bathed with vinegar and water ; part. equal. Take also often a slice of lemon with sugar. Take as a purge every half hour, two ounces of a decoction of rad. gramin. two ounces ; fruct. tamarind. one ounce ; boil in three pints of water to two ; sweeten with liquorice : take two drams of nitre, divide into six parts ; swallow one every two hours in a dose of decoction. Inject the following every fourth hour : common decoction

tion a pint, honey an ounce, nitre two drams. Panada for food. 8, P. M. Medicines given; some indurated fœces passed; urine high coloured; drops some sediment; pulse 98: strangury less; greater horror to liquids; continue medicines; use pedilurium. Take syr. diacodii one ounce; repeat every three hours, if necessary: take also frequently thirty drops of spirit nitr. dulc. 6th. at 6 A. M. Clammy sweat after the bathing and medicines last night; noise of water in bathing gave distress; pulse then 115, tremulous; urine paler; slept two hours at different times; free from pain, except when asked to drink; then pain at pit of stomach and belly, with sighing and convulsions. "In giving drink, it was remarkable, that he always took a second or third draught with less reluctance than the first; and therefore two or three draughts were commonly given him successively." 11, A. M. Pedilurium repeated, followed by an hour's sleep; pulse rose; Hydrophobia increased; if eyes be covered, can drink. 8, P. M. Great pain in belly and small of back; most acute when sitting up, or on motion: on drinking, feels a stinging pain in stomach; none in throat: after drinking, sweats about head and breast, "with
vehe-

vehement efforts to vomit, though nothing comes up :” pulse hard and 104 ; tongue white and foul ; fauces red ; urine pale : clyster given ; some flime followed ; hands cold. 10, P. M. On attempting to drink, horror ; convulsions, deep sighings ; “ and after these, retchings, vomiting, increased quickness of pulse, and return of pains.” Saliva spat out with great quickness and aversion ; does not complain of its bad taste, neither spits on, nor offers molestation to by-standers : if he slumbers a few minutes, is interrupted by deep sighs and convulsions ; after bathing, pulse 120, though generally 100, with interruption : voided an ounce of turbid urine ; with reluctance took some panada ; slept half an hour. 7th. 8, A. M. Quite delirious lately ; now sensible ; attempts to drink ineffectually. 11, A. M. “ Efforts to drink always produce belchings, retchings to vomit, and pains, which begin in the lower regions of his belly, and squeeze every thing upwards towards his stomach, attended with convulsions and deep drawn sighs :”---“ eyes dismally wild, red, and inflamed :” talks much of wife and family with great affection ; speaks religiously ; says he is dying ; pulse quick, weak, and intermitting. Take musk ten grains ; repeat

repeat every hour: deglutition being stopped, repeat clysters the oftener: give a little of nitre and sugar in powder frequently. 4, P. M. Took musk bolus three hours ago: Death approaches, with pulse intermitting; cold sweats; cold extremities: attempting to drink, it regurgitated; sighed deeply, and--- is no more.

N. B. A looking glass placed before him did not discompose him.

Treatment---Comprehended in the above.

Dissection. Stomach much contracted; empty.

Small intestines---found, except ileum a little inflamed, with a few livid spots; sac of colon as large as one's head, containing air and much fæces. The whole intestines displaced, and out of their natural situation.

Liver---somewhat livid; gall bladder much distended with bile, tinging considerably adjacent parts of colon, of omentum.

Thorax---natural.

Larynx, pharynx, and cranium not opened on account of the surgeon's cutting his finger. Is this the case alluded to by Morgani?

CASE XLVII.

Mr. Nourse's patient, Stephen Bellas, aged 16, bitten by a dog on his right thumb, in June 1735.^c

This took place in London : it is the longest of commencement on record of well-authenticated cases from rabid infection. Whether a second accident had taken place cannot be positively known. The great deviation from what I consider as a general law, would lead me to the conclusion of a second bite ; but the vicinity of the patient to Mr. N. with the apprehension which the boy and his friends entertained respecting the disease, weakens the suspicion ; as, in that case, he would have been immediately consulted, they living in contiguous houses. The late Mr. Pott attended the patient with Mr. N. in St. Bartholomew's Hospital, and saw him cut for the stone in the interval between the bite and disease ; and remarked, that he never saw a wound heal more kindly. The lad was well,
and

^c Vid. Phil. Transf. No. 445.

and dismissed within five weeks. He saw him likewise at the end of nineteen months from the time the bite was given, writhing in all the distress which Hydrophobia usually exhibits. This he mentioned many years afterwards in a conversation with Mr. Foot.^d

The dog, which was of the grey-hound breed, and belonged to the family, was not at the time suspected to be mad. The creature seemed not to be angry, but to be even in a playful mood when he snapped at the lad, biting him in the *slightest* manner; but it was evinced in a short time by the animal's dying mad.

Prophylactic. Mr. Nourse called in immediately after the bite: proposes a ligature above the part, and the application of the cautery: this not complied with, he next ordered Dampier's powder, at this time in great celebrity. The dose a dram, given within an hour of the accident, and repeated next morning: went to Gravesend; remained there ten days, dipping daily in the salt water: night and morning; also took the powder, continuing it for forty days.

Symp-

^d Vid. Foot's Essay on the Bite of Mad Dog, p. 76.

Symptoms. Jan. 11, 1736-7. Evening. Three of the fingers, of the hand not bitten, numb. 12th. Sick; great pain across the patient's stomach, and in all his bones; thought to be a cold. Evening. Pulse full, hard, with some fever. When asked what he ailed, answered, nothing, but could not swallow. Mouth examined; no inflammation; no appearance seeming to prevent swallowing. A little sack-whey offered, and attempted to be drank: the consequence was, convulsions, horrors, with sweat over face and head; repetition of spoonful of whey; similar, but never severer effects. Night restless, sleepless. 13th. Morning. Frequent retchings and yawnings. Noon. Violent delirium; foaming at mouth. 7, P. M. Death.

Treatment. 12th. Venesection; repetition of the prophylactic powders taken at first: every four hours clyster.

Dissection---None made.

CASE XLVIII.

Professor Plummer's patient, a student seventeen years old, bitten by a dog in the middle finger,

finger, on the right hand, the beginning of
Dec. 1728¹:

This was in Edinburgh. In the beginning of January the disease occurred, being about a month from the accident. Wound soon healed.

Symptoms. Pain in the bitten finger, stretching up the arm; numbness of the finger. Jan. 6. Hot and restless night. 7th. Night worse; intense pain of the finger; febrile heat, with succeeding sweat: thirsty; attempted to drink beer, but could not. 8th. In the morning attempted again to drink unsuccessfully, letting fall the cup, and complaining of pain in swallowing: pain of head; giddiness and staggering; sickness at stomach. At night slept some; sweat moderately. 9th. Speech somewhat incoherent; sighed deeply; respiration impeded, with interruption, as he said, to the motion of his heart. During the day convulsions, with distortion of countenance; respiration quicker; pulse frequent and feeble; attempted by persuasion to drink, but in vain, dashing it from his mouth with horror and shivering. At noon tossed much; face red

H h

and

^c Vide Med. Essays, edit. 1, vol. 6, part ii. p. 591.

and bloated ; eyes wild and staring ; constantly squirting out his spittle ; sometimes starting up suddenly from his seat, then throwing himself down upon the bed ; answering questions composedly. Antipathy to his comrade, whom he before loved : was subject at this time to gonorrhœa, for which he nightly had taken calomel, and next morning a purgative. This day became furious ; attempted mischief on his comrade, and was obliged to be confined by two strong men : roared, foamed, and tossed through rage, so that the men, by the force of his fury, were heaved up and down as they pressed with their strength upon him : profuse sweat on face, breast, and arms : answered questions at this time rationally : fit lasted an hour ; was asked to drink ; answered he wished for it, for his thirst was great : attempting to drink, fixed his teeth in the vessel ; took some milk and water into his mouth, but squirted it out with violence : convulsed violently, followed by a vomiting of a bilious phlegm, with some thick black matter like clotted blood : paroxysm returned ; struggled and attempted to bite. Evening. Foamed at the mouth ; violent vociferation ; convulsive motion, like the hiccup, but stronger : face dis-

distorted with spasms ; still rational, and knew the professors who attended him. At six at night died exhausted.

Treatment. Ordered an emollient and anodyne fomentation, and a cooling diet ; bled to ten ounces, with a temporary relief : orifice afterwards broke open with struggling, by which about twenty ounces of blood were lost. Ordered a purgative ptisan.

CASE XLIX.

Communicated by Dr. Adams of Daventry, to Dr. James.^d

William Bland, a farmer of Northamptonshire, aged 40, applied to Dr. Adams of Daventry, for what he termed a *fore throat*, supposed from cold. No suspicion of bite of mad dog. Two days after this Dr. A. again saw him ;

^d Vide James on Canine Madness, p. 60. Dr. J. says, that it was the death of this man which determined him to study the disease. When a boy he knew the patient, who at that time was a celebrated wrestling champion of the country. His melancholy catastrophe made a deep impression on Dr. James's mind.

him; found him restless, uneasy, anxious, yet followed his employment: no fever; intellects clear, but difficult deglutition increased. Some ale being brought to Dr. A. while he talked with the patient, he started up from the table at the sight of the mug, and ran away. Dr. A. now was told, that a little before this he went to draw beer, was frightened on appearance of liquor, running away with spiggot in his hand. Was questioned now by the doctor respecting bite of mad dog; denied it, but reminded by one of the family of a little dog (four months before) who met him coming from market, and was bitten in endeavouring to catch it, and the animal escaped. Wound a mere scratch, without blood, never recollected till this moment.

Symptoms. Anxiety hourly increasing; paroxysms, with convulsions and tremors at intervals, hourly more violent: difficult deglutition increasing towards death; this took place like one strangled.

Intellects not impaired during disease: little or no fever.

CASE L.

Dr. Mead's first patient, a lad, bitten by a mad bitch, on the 20th of April, 1709.*

This boy was about nine years old; was severely wounded on the cheek; complained of indisposition for the first time May 22; appeared dull; pain in the stomach; ate a little spinach to dinner. This evening head ach; increased pain of the stomach; drank a glass of brandy; night very restless; screamed out when offered drink; strangury to a great degree, exciting cries on attempting to pass urine. Next morning vomited up the spinach undigested, which he ate at yesterday's dinner. Towards the afternoon this day great aggravation of symptoms; sweat profuse; trembled much; tossing incessantly; looks wild; pulse very irregular; urine appeared healthy; inability to swallow. Next day (24th) worse; delirium through the night; white objects offensive, so that he declared that he should be well if the women with white aprons would leave the room.

* Vide Mead's Works, vol. 1, p. 244, Edinb. 1765.

room. Thirst considerable; asked to drink from a black pot, thinking a white one prevented him; but tried in vain. Ate now some bread and butter heartily, but vomited it up quickly, together with a frothy slime: violent convulsions; eyes more staring; pupil greatly enlarged; cold sweats: death at four this afternoon.

Prophylactic. Wound dressed with the common plaisters of the times; cicatrised in fourteen days; took a bolus every night of theriac. andromach. ate the liver of the mad dog fried.

Treatment. Blisters ordered to the back, and each side of the neck; diuretic bolus of sal. succin. camphor, and conserv. lujul. every six hours. Warm bath.

Dissection. Vide vol. I, p. 239.

CASE LI.

Dr. Mead's second patient, a robust man, aged 45, bitten on one of the fore fingers the last week in August, by a small dog.^f

This

^f Vide Mead's Works, ut supra.

This patient began to complain on Nov. 8, or ten weeks from the accident. This morning sickness at stomach, with a vomiting of green and yellow choler. Next morning deglutition impeded; tried in vain to suck thro' a tobacco pipe. 11th. The doctor found him tied in bed; tossing; vociferating murder; biting and spitting at the by-standers; begged to be unbound; tried again in vain to drink; grew again unruly; was again tied down; right arm paralytic; only moved it by the help of the other: attempted to read, but prevented by a mist before his eyes; afraid of every one; enraged at those he before respected; fits again returned; death.

Treatment. Nov. 9. Emetic of rad. ipecacuanha. 10. Venesection to eight ounces; bolus of theriac. andromach. with lap. contrayerv. 11. Dr. M. first saw him; directed venesection to *twenty* ounces; blood very thick and black.

Dissection----None made.

CASE LII.

Dr. Mead's third, a young man of 18, bitten by a mad fox on the back of the hand, which had been bitten by a mad dog.^s

This case was communicated to the doctor. It happened at Stamford in Lincolnshire, some time after his other two. Distance of disease from accident was *three* months. Cicatrix not quite complete when disease appeared.

Prophylactic. Theriac. andromach. to wound.

Symptoms. Convulsions; bit a piece out of the glass in which drink was offered; violent priapism; penis as hard as a bone: disease lasted three days.

Treatment. Emetic given at commencement of disease; bled; blistered.

Dissection. Vide vol. 1, p. 239.

Dr. M. mentions the festering of a scratch on the surgeon's finger, which became very painful, and troublesome to heal. The same thing nearly took place during the dissection
of

^s Vide Mead's Works, ut supra.

of his first patient. A small plaister being rubbed off the finger, in turning over the parts, the scratch it covered was moistened: an inflammation followed, with a painful and troublesome erysipelas.

CASE LIII.

By M. de la Pryme.

A boy, 14, not bitten, but having only put his hand into a mad whelp's mouth.^a

"The boy," says the author, "took the disease not from a wound, but merely by putting his finger into the throat of a whelp, when they found it could not swallow, to see what it ailed." The mother of this, and some other whelps, were bitten by a mad dog; became mad, as did all the whelps, in about three weeks after, except this one. After some time longer this also showed signs of the disease, and in a day or two more died.

Symptoms. Pain of head; feverish, and continued better and worse for some time: had

^a Vide Phil. Transf. No. 277.

had a cough; eat hearty, yet could not drink: sensation of the cold air gave great uneasiness; “he ran from it,” as it is expressed, “as if it had been to save his life, and said, that the wind would needs stop his breath.” In a day or two more became worse; vomited a matter like blood, “which stunk like fallad oil, but much stronger: after which he would be pretty well, and walk about; but most commonly ran as fast as he could, first out of one corner, then into another, then up stairs, then down again, as if it was for his life.” On the third day of his confinement grew perfectly mad; would start, leap, and twist his arms together. His fits were now so strong, that four men could hardly hold him: wanted to bite; struggled some time longer, and became speechless; and, it is added, “then died just as the physician came.”

CASE LIV.

Mr. Turner's patient, a child three years of age, bitten by a dog in the cheek, in 1688.ⁱ

In

ⁱ Vide Phil. Transf. No. 37.

In this young patient the wound was large. Immediately after the accident they brought the child to Mr. Turner.

Prophylactic. Escarotics to prevent the wound from healing were used for some time. In three weeks the part was healed ; two days after the child grew ill.

Symptoms. Febrile affection ; “ disorderly pulse and palpitation of the heart.” This night delirium ; next day strong convulsions ; distortion of the eyes ; “ irregular expansion of the optic nerve ;” (the author means, I presume, the pupil) with fierceness of visage ; watchfulness ; trepidation ; constant motion of under jaw ; voice hoarse ; hiccup ; discharge of saliva ; started from the sight of a looking glass presented to him. Died this evening, notwithstanding the exhibition of *alexipharmicks*. These, it is presumed, no detail being given, were some specifics of the day. His death was attended with smiles, or spasmus synicus, as Mr. T. calls it.

Treatment---Nothing farther mentioned.

Dissection---None made.

Mr. T. observed that the body externally appeared *livid*.

CASE

CASE LV.

Dr. Howman's patient, bitten by a mad fox in the right hand, 1684.^k

This happened at Norwich, about the middle of August. The doctor first saw him on Wednesday, October 1, about six weeks from the accident. Was told that the wounds bled freely at the time, and soon healed spontaneously.

Symptoms. Some days before pain at intervals in the bitten hand and arm. Thursday. Bitten hand and arm paralytic. This day "the great symptom (Hydrophobia) appeared." Friday. Dr. H. returned; found patient rational. Since yesterday great sensibility of nerves; starting at the sight of any person approaching; complained of suffocation on the smallest motion of the air; voice tremulous; speech broken and interrupted. This night at ten symptoms aggravated. Saturday. Died this morning between twelve and one, being sixth day from commencement.

Treat-

^k Vid. Phil. Transf. No. 36.

Treatment. A purge of scurvy-grafs operating violently; V. S. in left arm to seven ounces; blood appeared healthy. The doctor prescribed "the best temperate antispasmodic and antiparalytic remedies he knew, to be mixed with the specifics of common use in an Hydrophobia." Continue remedies last prescribed. This appears not to have been done, for *another*, he says, was called *in* during his absence, "who gave him many remedies." Dr. H. had been in the country, but returned on Friday to witness the last hours of his patient's life.

CASE LVI.

Dr. Lister's patient, James Corton, bitten by a dog in the right hand, about Feb. 5, 1682-3.¹

This happened at York. The doctor first saw him on Monday, the 12th of March.

Symptoms. Pulse flow, tremulous, and intermitting on the first days: convulsions afterwards at intervals; at intervals rational; for
on

¹ Vide Phil. Transf. No. 35.

on the day of his death, on the doctor's visiting him a second time, he found him with the minister, praying very earnestly, and desiring the sacrament, soon after which he died.

Treatment. Sunday (11th) Took some discordium from his apothecary; also some cordial water was offered, which he could not swallow. Monday (12th) Bled in the bitten arm; blood without inflammatory marks, and in every way with an healthy appearance. Wound scarified, then covered with blisfering plaister; same applied to inside of arms and neck: antidotes of the day next used. "Theriaca, cinis cancrorum, ruta, agaricus, &c. in boluses." Of these took a dram every hour for about twelve times. Tuesday (13th) This day "had a fever on him." On recovering from a fit, "took an helliborism in a bolus very willingly." Three or four copious stools followed, "and he declared himself wonderfully relieved by it."

CASE

CASE LVII.

By Ramazzini, as related by Morgagni.^m

A maiden lady at Modena, bitten by her own lap-dog in her lip, early in the sixteenth century.

Morgagni says he read an account of this case in M. S. which was written by Ramazzini near 80 years before, but who was forbidden (the reason not adduced) to publish it.

The disease commenced 50 days after the accident. Whether indisposition had taken place earlier than her discovery of dread of water is not absolutely certain; but comparing it with other instances, the probability is in favour of a previous indisposition. The lady however could not be very seriously indisposed at the time she first perceived her aversion to water, because it was during an excursion into the country, where, happening to pass over a small stream, she was instantly struck with horror at the sight of the water. Nothing was far-

^m Vide Epist. 8, Art. 29.

farther from her thoughts, it is added, than Hydrophobia.

Symptoms. One of the most distressing was the disagreeable sensations produced by cold air. She felt, as she thought, a small wind striking upon her head: “cried out vehemently again and again, that the windows and doors might be closely shut.” The least motion of the bed clothes made her cry out. “If any person offered her a fan, then she was exceedingly frightened, and was seized with the most violent convulsions.” Some water was forced on her; dreadful convulsions followed, and speedily after death.

Treatment---None mentioned.

A SHORT ANALYSIS OF PAPERS RELATIVE TO HYDROPHOBIA,

In the Memoirs of the Royal Society of Medicine of Paris. Part 2, for the Year 1783.

THIS volume, except a paper on the bite of the viper, is composed of treatises on Hydrophobia.

1. *By Dr. Roure of Aix.*ⁿ

Elzeard Roche, aged 15, was bitten on the left foot the 3d or 4th of Nov. 1781, by a dog, supposed mad. The wounds soon healed. He continued in good health till the 45th or 46th day from the accident, when he felt a pain in the bitten leg, extending up the thigh, so as to make him lame.

I i

Dec.

ⁿ Vide page 32.

Dec. 26 (53d day from the bite, and a week after the commencement of the pain in his leg) while at supper with his family, he first discovered horror at the sight of the fluid he was about to drink, and felt some difficulty in deglutition. This circumstance brought to his remembrance the accident. He became alarmed, and sent for his physician. This was Dec. 29, and 56th day from the bite. At this time the pain of the leg and thigh was acute, but neither swelling nor inflammation appeared in the cicatrices. This evening the pain of the limb ceased; he passed the night in a restless manner, and his saliva became troublesome. The doctor gave him six drops of fluor volatile alkali. Next, mercury was exhibited, yet he died on the third day. Leave could not be obtained to inspect the body.



2. *By Dr. Thieffet, of Troyes.*^o

He gives an account of 20 persons bitten by a mad wolf, Dec. 1774, nine of whom died
of

^o Vide page 40.

of the disease. Some of them were opened five or six hours after death, and in spite of the cold of the season, were found so *putrid*, that it was dangerous to approach them. In opening one of them the surgeon wounded his hand, but no bad effect followed.

A serious memorial was presented to the Intendant of the province, to know whether the disease could be *inoculated* by *cohabitation* between man and wife.



3. *By Dr. Gallet Duplessis, of Carcassonne.*^p

This is the case of a man, 46 years of age, bitten by a mad wolf. It was *three months* before the disease made its appearance, which was in July, 1778. The patient had all the common symptoms, with fear of cold air, and dread of water. The only particular symptom seemed to be diseased *smell*, which was to a great degree. He fancied the breath of those around him to be very disagreeable, resembling the smell of the wolf that bit him.

A dif-

^p Vide page 46.

A dissection was made, but it is not very instructive; nor does it seem to be made with much accuracy. No notice is taken of the stomach. The lungs were sphacelated in some parts. The left side of the heart was shrunk, and soft; the other half was in its natural state: the auricle, which was *flaccid*, contained *black* and *grumous* blood.



4. *By Dr. Mignot de Genety, of Thiers.*^a

Marie Guittard, aged 60, was bitten by a mad dog Sep. 9. The accident alarmed her exceedingly. Some quack medicines were advised by her acquaintance, which she took as preventives. They had so far a good effect, that her mind became tranquil. About the end of the first week of October she felt a slight pain in the wound, which was on the back of her hand, and at the same time a prostration of strength, with a numbness stretching up the fore part of that arm. The shoulder of the same side was similarly affected. Her inquietude

^a Vide page 48.

quietude at this time, with frequent pandiculation, pointed out evidently the incipient stage of fever. She continued in this state till Oct. 10 (about three days) when, after passing a restless night, the disease became manifest. The oppression was considerable; respiration difficult, with melancholy. To these were added internal heat, and other symptoms peculiar to the malady. She was able however to swallow soup; nor had she the least aversion to liquids. She showed no symptoms of fury, but much anxiety and agitation, which continued to her death. An universal sweat covered the surface, and her extremities were cold. She died on the night of the 13th, without either fury or dread of water.

*By the same.**

We are presented here with a case of Hydrophobia, from the bite of a mad wolf, in Feb. 1764. It is well marked, having all the symptoms usually found in Hydrophobia. The disease did not appear till about a *month* had elapsed; and the boy died in 24 hours after.

Dif-

* Vide page 50.

Dissection. On opening the body the trachea was found inflamed. The *stomach* and *intestines* were inflamed (meteorises) containing a number of lumbrici.

*By the same.**

This is the case of a woman, aged 26, bitten in the arm by the same wolf, and was seized two days after the last patient with the disease, and died in 36 hours.

The dissection exhibited the same appearances with the preceding subject.

5. *Cases of spontaneous Hydrophobia, by Dr. Gallet Duplessis, of Carcassonne.†*

The first is an instance of a poor man seized with the disease from passions of the mind. He was compelled, by necessitous circumstances, to labour for his brother, a man of a harsh and austere disposition. He toiled hard every day even without a sufficiency of food. On re-
turning

* Vide page 55.

† Vide page 57.

turning to his brother's, this inhuman relative cruelly upbraided him on account of his poverty: he passed two days in great agitation in consequence of this treatment. On the evening of the last of these days (4th of July) he refused all food, and in spite of his thirst, which was intense, could not bear the approach of a glass of water to his lips. The air which he breathed was even insupportable to him. On the 5th the dread of water increased, and even the sight or noise of it, when poured out, threw him into violent fits. The air continued to give him great uneasiness, and he could swallow nothing. On the nights of the 5th and 6th he showed a propensity to bite those around him. On the 7th he was sometimes seized with fits, which left him in a state of great weakness; and at night fell into a convulsion, in which he died.

*By the same.**

The second is the case of a young man seized with the disease, from biting his fingers in a fit of resentment, occasioned by jealousy.
He

* Vide page 59.

He had formed an attachment for a young woman, which was reciprocally returned. They lived in mutual regard for some time; but the young man's passion soon after cooled, and he deserted his mistress. Her affection increased in proportion, and she upbraided him with neglect; but all her entreaties were in vain, she could not recover her lover. Under these circumstances, to rouse his jealousy, she feigned a passion for a young man of his acquaintance, and which after some time, from the young man's abduity, became real. The stratagem had the desired effect: it awoke the other's jealousy. He now used every means to recover her lost affection, but in vain. Under this violent impression, all hopes being gone, he bit his finger so as to penetrate the skin; the consequence of which was, that next morning he felt lancinating pains in the bitten finger, extending up the whole arm. His head became affected; convulsive fits rapidly succeeded each other. He was seized with a dread of water, refused all aliment; the air suffocated him; he threatened to bite those around him, and died in a fit on the fourth day.

The

The young woman was so affected by his death, that she refused every engagement, and lived in a state of celibacy.

Another case is related by M. Martin de la Caze.^w This evidently arose from fear, viz. dread of a beating. After some altercation, the man who was the subject of it was attacked with the disease, dread of water, the contact of cold air, and difficulty of deglutition. He was a common porter, but of unusual sensibility for his station of life; and described as of a sanguine temperament. After suffering under the disease for five days he died.

Dissection. The œsophagus was found in its natural state; the stomach shrunk, and its vessels turgid with blood. The rest of the dissection seems foreign to our purpose.

Another related by Dr. Seganville, of Lavaur,^x arose from mania, induced by intoxication; one of the symptoms of which was a dread of water. The patient was attacked with a sense of burning heat at three in the morning, and died at five that day.

^w Vide page 60.

^x Vide page 71.

6. *Next is a Paper on Satyriasis followed by Hydrophobia.*

M. Salva communicated to Dr. Bouteille the case of a man, 36 years of age, who was, on Monday, Nov. 10, 1783, attacked with an incessant erectio penis cum feminis emissione copiosa. In this state he remained, more or less, till the 15th. He then became thoughtful, sad, and oppressed, and harrassed with the same salacious propensities; yet, though a married man, from some extraordinary apprehensions, he remained continent for some days.

On the 16th a complete Hydrophobia came on: even the noise of water poured from one vessel into another distressed him. In a word, he had all the symptoms which attend the disease from the bite of a rabid animal. On the 18th he became furious and delirious, so as to require to be bound. He spat much upon the by-standers; continued to have the same aversion to liquids, and at eight in the evening of the 19th he died.

M. Bou-

M. Bouteille observes, that the symptoms in this patient were exactly similar to those of six persons whom he had seen die hydrophobic, at Sifferon, in 1772, from the bite of a mad dog. This however was a case of spontaneous Hydrophobia; for on the strictest inquiry it appeared, that he never had been bitten by any rabid animal.

The most remarkable circumstance in this case is, the urgent satyriasis.

M. Salva considers the remarkable part of this case to be, not that the Hydrophobia was spontaneous, but that it was a symptom of the satyriasis.



7. *By Dr. Houffet, of Auxerre.**

The case he details relates to a mad she-wolf attacking and wounding several persons and dogs at Vallau, and other villages, in the neighbourhood of Auxerre. The author is very particular in describing the manner in which they were bitten, and the number wounded.

* Vide page 110.

wounded. In these minutiae it is not necessary to follow him.

One of them, Louis Michaut, bitten in the cheek, is represented as becoming hydrophobic at the distance of *three* months from the bite; and after struggling with the disease seven days, died in the usual way. His wounds were dressed with a camphorated mercurial ointment; and he trusted to the internal use of an omelet that was recommended to him.



8. *M. Burchard Frederic Munch presents us with a Paper on the Efficacy of the Belladonna in Rabies.*^a

This author reminds us, that both Pliny and Apulius have spoken of the external use of the leaves of belladonna in rabies: but that Mayerne was the first who recommended its internal use; yet it does not appear that he had ever made trial of it. It was long neglected, till one Richter, a miner, used the powder of the root, as a nostrum for the same purpose; which,

^a Vide page 115.

which, in 1728, he communicated to M. Hansen, from whom it passed to M. Munch, the father.

Nothing but loose observations in regard to its efficacy were published, till 1773, when a M. Ruling communicated the case of a girl severely bitten by a mad dog, to whom he administered, as he says, with the greatest success, the powder of the leaves of this plant. Dr. Schroder also informs M. Munch, that he had given the powder of the root with success to four men, three of whom were bitten by a mad dog, and one by a mad cat.

M. Munch continued his researches, and in 1779 he communicated to Dr. Richter eleven observations, which the latter published in the *Chirurgical Journal*. In these he affirms that this remedy is not only a prophylactic, but also a cure of rabies. M. Munch pretends to have more than an *hundred* cases wherein the leaves and root of this plant proved efficacious. Among these there are two wherein it was given in the first stage of the disease.

The author then proceeds to describe the effects of this remedy upon the human body, which are nearly similar to those produced by hemlock. Besides its more immediate effects

fects as a narcotic, it is said to operate by urine and sweat. He endeavours also to make it appear, that it may be equally useful in the more advanced periods of the disease, when Hydrophobia has actually taken place. He then proceeds to detail the doses of this plant, and the manner of cultivating it in gardens, which we think unnecessary to describe here, especially as the cases are altogether vague and inconclusive.



9. *Cases by Mess: Poissonnier, Desperrieres, Andry, Vinq-d' Azyr, Delalouette, the Son, and Thouret.*^b

The first in this paper is of a boy, 12 years old, named Briquet. He was one of 15 bitten by the same mad dog. He became affected 58 days after the bite, having used mercury for three or four weeks, and been slightly salivated. He was first affected in church, and in returning home and taking a little wine, it was vomited up a short time after, with a quan-

^b Vide page 126.

quantity of black matter. The first symptom was announced by an unusual effect of the air, which by inspiration rushed up his nostrils, creating a pain in the temple, and in the course of the frontal sinuses. The following night at 9, P. M. it was observed by the Prior of the Charité (the hospital where he had been salivated) that the bitten cheek was swelled, but the lad, on being interrogated, denied to have felt pain in the cicatrices. They applied the actual cautery to the wounds, and the plan they pursued was sudorific. Eau de luce was the medicine given, and in the dose of ten or twelve drops every three hours. On Tuesday, the fifth day from the attack, he swallowed with tolerable ease, and spat considerably. The physician wishing to try the effect of music on a person in this situation, ordered a guitar to be played in the chamber, the sound of which the lad not only bore with ease, but seemed to be pleased and soothed by it, while the pulse at the same time became more regular. On Monday, 10th day from the attack, at 5, A.M. he vomited a large quantity of brown and black matter, and it was ejected with such force as to strike the bottom of the bed; and in about an hour and half after died.

The

The body was opened three days after death. No marks of disease appeared in the œsophagus. In the stomach a quantity of viscid and brownish black fluid, with a lumbricus, was found; and 13 more, with some of the same fluid, in the small intestines. The blood in the auricles was black and fluid. The heart sound, and no water in the pericardium; nor in the thorax, abdomen, nor ventricles of the brain. The pancreas, liver, and spleen were found. The lungs somewhat collapsed. This boy was bitten Jan. 27. The dissection is of little use, on account of the time that elapsed between death and the examination.

Catherine Champion, 55 years old, was bitten on the lip and cheek, on the same morning. She was of a very melancholy temperament, and subject to asthma. On the 30th day from the bite she became affected with Hydrophobia. On carrying her from the apartment of the hospital where she had been placed, to a different one, having to pass a court, and it snowing at the same time, she was much agitated at the sight, altho' it was at night. Among other symptoms common to the disease, the author expressly notices vomiting.

miting. She spat often, and roped it herself from her mouth with her fingers. Convulsions were frequent ; sensibility to the cold air great. Pulse weak, interrupting, and vacillating. The plan pursued was sudorific. The doses of the medicine were in powder, and these large and frequent. She became blind ; and it was particular, that as the disease advanced her temper changed ; for naturally it was morose, gloomy, and taciturn ; but it was now changed to one placid and affable ; and as the sensations increased she was more lively. She recovered her sight in nearly half an hour. This patient had the sensation of flames scorching her back and belly, and could not be persuaded to the contrary, desiring her physician to feel, that he might be convinced of it himself. Not long after this she died, about three days after the disease first appeared.

Dissection. No inflammation either in the fauces, larynx, or pharynx ; but the membranous parts of the cartilaginous rings of the bronchiæ were somewhat inflamed. The œsophagus was in its natural state. The lungs natural : in the vena cava and axillary veins the blood was *very fluid* and *very black*. No serum in the pericardium : the heart was in its

natural state. On opening the stomach there was observed on the internal coat of its great curvature, and towards the fundus, several points of inflammation; and in the small intestines there were several of a smaller size. The liver was in a healthy state, and the bile in the gall bladder very fluid. On examining the brain the vessels were found turgid with blood, and no water in the ventricles.

The *Sieur Gravan*, one of the 15, aged 72, of small stature, lean habit, and melancholy temperament, was bitten on the naked hand, and from the moment of the accident considered himself as lost. Mercury was the prophylactic treatment here likewise, and the salivation was carried on to a considerable extent, by which, and the use of purgatives, he was greatly reduced. On the 27th, 28th, and 29th he felt slight chills on going to sleep. On the 36th day of the treatment (and 38th from the bite) he felt the first symptom of difficult deglutition. The wounds which had been enlarged, on the 7th day continued open. Finding the methods employed for the other two useless, they determined to try vinegar said to have been a successful remedy in this disease. This was exhibited in the form of
injec-

injection, by acidulated drink, and by inhaling the vapour, which last they were obliged to omit, as he complained of its suffocating him.

Having observed in the woman Champion some advantage in swallowing from the use of blisters round the neck, it was applied in this case apparently with some slight benefit. On the second day of the disease he had an inclination to vomit, and did spit up some glairy matter. By continual efforts to vomit during the night, he discharged nearly a gallon of a thick glairy matter. Doils dipped in warm vinegar produced shivering and disagreeable sensation. The vomiting continued through the night, till twelve next day. The quantity of vinegar in each injection was three ounces. The agitation and horror expressed at the approach of drink were great: he frequently threw the vessel on the ground. At 9 at night felt the current of cold air very disagreeable: a pinch of snuff caused the same uneasiness. Two grains of opium in vinegar was administered, which produced tranquility, but no sleep. At six o'clock on the morning of the third day the agitation was very great: he attempted to throw himself out of bed, which they were obliged to prevent by force.

He

He discharged a quantity of saliva, and uttered plaintive cries, complaining of pains all over him. The opium and vinegar draught was again administered, and again produced tranquility without sleep. He became at length furious, and they bound his feet together, which increased his fury. All his symptoms increased till six o'clock on the evening of the third day, when he expired in a strong convulsion.

Dissection. The body was opened about 16 hours after death. There was no inflammation in the pharynx, larynx, nor œsophagus. The right lung was somewhat shrunk. On the stomach there were found points of slight inflammation; and its internal coat, near the pylorus, appeared very *soft*, and as if *macerated*; and this condition approaching to *sphacellation*, was more distinct in the duodenum; and there were some points of a slight inflammation towards the termination of the ileum. The other viscera were found. The abdomen, thorax, and pericardium contained no serum. The heart was found, containing no coagulated blood; but in the aorta was a very large quantity of blood nearly fluid, and of a black colour: the venous blood was of the
same

same quality. On opening the head the blood vessels appeared turgid, especially the longitudinal sinus. A considerable quantity of water was found in the ventricles.



10. *Cases of Persons bitten in 1784, near Brive, communicated by Mess^r. Rebiere, two Brothers, and Surgeons at this Place.*_c

No fewer than 17 persons were bitten by a mad wolf on this occasion, ten of whom perished by the disease. Nine continued from the second to the third day after the appearance of the first symptom, and one to the fifth. The author informs us, that these persons died in the following order: The first on the 15th day from the bite; the second on the 18th; the third on the 19th; the fourth on the 28th; the fifth on the 30th; the sixth on the 33d; the seventh on the 35th; the eighth on the 44th; the ninth on the 52d, and the tenth on the 68th.

Mer-

Mercury was used in all these cases, and the patients were more or less salivated. Their wounds continued open till the time of their death, except the tenth, which healed up eight days before. They applied vipers to two of them on the first day, and to a third on the second day of the disease. No effect was observed from this bite, except a slight areola round the orifice, though the vipers were strong and lively. The conclusion to be drawn from these experiments is, that the poison of the viper had no effect in destroying the hydrophobic virus; and the author very properly remarks, that the practice cannot be hereafter followed with hopes of success, but on the contrary, to say no worse, must produce additional irritation. The patients followed their common occupations till the appearance of the disease.

11. *Some critical Remarks on the Abbe Fontana's Treatise concerning the Poison of the Viper, by M. de Roux, of Dijon, which obtained the first Prize from the Royal Society of Medicine, March 11, 1783.*^d

In this paper M. Roux treats of local nervous irritation, as chiefly giving rise to the symptoms succeeding the wound, in contradiction to Fontana, who considers its action to be chiefly on the blood. He lays down two indications of cure: first, to diminish the sensibility of the nerves; second, to weaken the power of the venom, or to extract it completely from the part. He gives an example of a country woman bitten by a viper on the fore finger of her right hand. In this case he applied a ligature below the wound, and directed the part to be fomented with olive oil for the space of a week, and the ligature to be removed next morning.

^a Vide page 213.

12. *Far-*

12 *Farther Remarks on the Bite of the Viper, from a Paper sent to the Royal Society of Medicine, by Mess. Chauffier and Enaux, Surgeons, at Dijon.*^c

In this memoir both the bite of the viper, and that of rabid animals are considered. Volatile alkali, and eau de luce are the remedies, in their estimation, most useful. The external treatment is directed to be made with pure volatile alkali, fomenting the part, and applying compresses, well soaked in it, of about an inch in size. A quarter of an hour after or so warm olive oil is to be well rubbed in, and the whole is to be covered with a linen bandage, taking internally at the same time volatile alkali. In recent cases, before marks of much debility appear, these means, they think, will be successful,

But if the disease has produced more violent effects, it will be necessary to remove the centre of irritation, and destroy the part. Caustic is the means recommended. Gunpowder
has

^c Vide page 218.

has been used; spirit of wine also dropped on a piece of cotton, and pressed to the bottom of the wound. It may be necessary occasionally, they think, to enlarge the wound by deep scarifications, filling it with butter of antimony. Two or three hours after this oil of olives is to be rubbed on, and soaked into the part.

The internal treatment in these cases is volatile alkali. The most convenient form, they think, is that denominated fluor volatile alkali, or eau de luce, which differs only from the other by a few drops of oil of amber. This medicine would be too powerful in its pure state; it must therefore be diluted. To delicate and weakly persons the dose should be two or three drops: to the more robust, from 12 to 15. Should no volatile alkali be at hand they give as a substitute a preparation of M. de Morveau.

Take a small quantity of sal ammoniac coarsely powdered, in a spoon or any convenient vessel: take an equal quantity of salt of Tartar. Dissolve them: mix them together, and immediately swallow them. Care is to be taken lest the mixture evaporates. A little tea or the like may be taken after it. The volatile

tile alkali should be preferred when it can be obtained: it is an excellent remedy both in asphyxia and in syncope.



13. *A Paper on Hydrophobia, by M. de la Roux, Surgeon, at Dijon.*^f

This appears to be a continuation of the same dissertation, which obtained the first prize on the 11th of March, 1783.^g In the former part he treated of the viper; in the present Hydrophobia, especially the spontaneous, is considered.

In this paper, treating of the spontaneous Hydrophobia, which he defines “Hydrophobia from an internal cause,” he maintains the doctrine of nervous irritation and sympathy, similar, in some respects, to what has since been advanced by Drs. Percival and Rush. An irritation stimulating the extremities of the nerves, particularly those of the alimentary canal, arising from the application of extraneous

^f Vide part ii. p. 1.

^g Vide p. 503.

traneous matter, such as the contents of the canal perverted from the healthy state by want of drink, acrid aliment, passions of the mind, uniting with fatigue. He relates an example of Hydrophobia arising from each of these causes.

The first is of a young man over-fatigued, by a quick journey in a hot day, without an opportunity of quenching his thirst. The second of a young lad who ate a large quantity of roasted beech nuts, an indigestible food. The third of a young woman, whose mind was highly agitated by repelling the attempts of a libertine from committing a rape on her. In each of these cases the symptoms of Hydrophobia were well marked, and they proved fatal.

He adduces several cases of tetanus, and violent spasmodic affections, from the bite of the viper, remarking, that if these have their peculiar symptoms, we need not be surpris'd that the Hydrophobia has its peculiar symptoms, the kind of irritation alone producing the difference. When the virus is introduced by a bite, he is of opinion, that it is not yet completely venomous, though with a considerable disposition to become so; and that it frequently

quently requires a long time to become a poison. *He* thinks, that should this poison be carried into the circulation, and be mixed with the fluids, it would be so diluted as to be incapable of producing the disease, which he supposes it incapable of producing, unless it was at rest, and confined to some circumscribed part, beyond the reach of vital action.

Among other circumstances in support of his theory, he relates the following cases.

Jean Petit, a child five years old, was bitten on the 15th of March, 1780; and, with other severe wounds on the head and face, had one on the great angle of the eye, which, as it was not certain the dog was mad, and for fear of destroying the eye, M. Roux did not treat with caustic, as he did the other wounds. The consequence was, that it healed up, as well as did the other wounds, except the one on the cranium, which remained open, and from which an exfoliation took place.

On the sixth of May following this eye inflamed, and the wound breaking open, discharged a bloody serum. The other wounds remained cicatrised, and without change of colour, while that which continued open on
the

the head, suppurated as usual, without any appearance of inflammation or change.

The patient became indisposed, with some subfultus tendinum, for six days: conceived he saw phantoms coming to pluck out his eye, and continued so until the 12th of May, when he began to refuse drink. Next day he could drink nothing: he was convulsed; discharged a frothy saliva; his eyes were wild and inflamed, especially the diseased eye, which was extremely red; and he died on the night of the 16th.

Francois Ethevenoit, a woman of 37 years of age, was bitten by a cat on the fore arm, near the wrist, and had no uneasiness about her situation till after the healing of her wounds. To render her mind tranquil and composed, he scarified the cicatrices, and applied to them butter of antimony. He gave her 12 drops of volatile alkali morning and evening, in a cup of tea. The ninth of June following (44 days after the bite) she began to feel some lancinating pains in the wrist, and on examining the wounds, that on the internal part of the arm, in the course of the tendon of the internal cubital, appeared inflamed, swelled, and painful. She would not submit
to

to excision. She took antispasmodics for some days, but afterwards refused them. The pains of the wrist increased, and extended up the arm to the shoulder. All the symptoms increased. Hydrophobia took place on the 15th of June, and she was found dead on her bed on the morning of the 18th.

Jean Arbelot, bitten on the 15th of March, 1780, left the hospital on the 18th of May, though he had a swelling on the left cheek. He returned on the 22d, with the Hydrophobia, which became complete on the 24th, and he died on the night of the 26th. The wound on his cheek, which was cicatrised, had on it a black crust. We are referred afterwards to a particular detail of the case.

M. Roux, who appears to be a man of strict observation, from the cases that came under his cognizance, thinks himself authorised to divide the disease into *two* stages, of which the symptoms of *difficult deglutition* marks the boundary. In one of his patients the incipient, or first stage, lasted six days; in the second the same number; in the third he could not so certainly mark the period, but believed it to be six. Sauvages is among the few that has made something like this observation.

vation. It was in a case which he notices in his Dissertation on the Hydrophobia, to which the prize of the Academy of Thoulouse was adjudged. The person had totally forgotten that he had received a bite, till he felt pains in the wounded part. He marked the disease from the commencement. He experienced exacerbations alternating with intervals, and ending with a sweating stage, in the common form of an intermittent, continuing eight days.

M. Roux relates more examples, taken from the cases which happened at Senlis, in proof of this observation. He observes likewise, that the first stage commences with some change in the part bitten. Our author, as well as Sauvages, with the greatest probability of truth, is of opinion, that the virus remains in the part, locally fixed, without mixture with the blood, till the commencement of the disease. He thinks also, that after the appearance of Hydrophobia the disease is incurable. Temperament, according to him, is the chief cause of the disease appearing at different periods from the bite. To this however he is inclined to add both the quantity and the quality of the virus introduced.

With

With respect to the spontaneous Hydrophobia, he thinks that it makes a more rapid progress than the communicated. The reason given is, that the irritating cause is spread over the alimentary canal, which is extremely sensible, from its numerous nerves communicating with the whole system.

Themison was the only physician among the ancients who pretended that the disease was cured in the last stage: this, he thought, was that of his own case; for having attended one of his friends who died of it, he fancied he had got the disease.

M. Roux quotes Nugent's case of Elizabeth Bryant, and passes the same censure on it which I had done in the first edition of my Remarks, and now repeat in this. It is satisfactory to be supported in this opinion by so accurate an observer. His paper however did not fall into my hands till twelve years after I had written that criticism. His remarks on her case appeared in the dissertation now under consideration, in 1783; yet though I published in 1785, I did not see them till May, 1797, while I was re-considering the disease, and preparing this edition for the press. I am no less gratified to find this sensible author

thor coincide with me respecting the use of mercury. He reprobates it both as a prophylactic and cure. He assures us of several cases where mercury had been used, which terminated fatally, after the patients went from the hospital, supposed to have been cured.

M. Thieffet saw seven persons die of Hydrophobia, though treated with mercury, of whom one perished the 58th day of his wounds, after 22 frictions. Dr. Oudet, of Besançon, salivated a female patient, yet she died hydrophobic five months after the accident. M. Lafon salivated six; three died. Dr. Revelat of Vienne, in Dauphine, lost a female patient, bitten by a mad cat, though treated with mercury. Dr. François treated with mercury three patients bitten by a wolf, yet they all died.

M. Roux cites several other cases, and the testimonies of many practitioners of eminence to prove the inutility of mercury.

The author concludes the second part of his paper, which he divides into three, with observing, that as the disease is local we can have no expectations from mercury acting on the habit in general. He suggests the propriety of cutting out the piece, even when the Hydrophobia appears. He thinks there is a chance

of escaping by this means, though no wise man will wait so long, if he has an opportunity of acting sooner.

The third part of his paper he employs in considering the cure. He begins by deprecating specifics, and he makes a nice distinction between the spontaneous and inoculated diseases, on which he founds his method of cure. The internal or spontaneous being, according to him, produced by certain fluids, especially in the intestinal canal, which act by irritating the nerves of those parts. For this species he exhibits internal remedies. To remove the inoculated, which he thinks acts on the parts of the nerves, where the poison touches, he has recourse to external means.

In treating the spontaneous species he admonishes to proceed, as in cases where actual poison had been swallowed, with mucilaginous drinks at first, and afterwards directs them to be sharpened with emetics to excite a slight contraction in the alimentary canal; because he finds such remedies to succeed both in vegetable and mineral poisons. After these he advises the use of milk and oleaginous substances to envelop, according to his ideas, the acrid particles, and to diminish the irritation
of

of the intestines ; and afterwards to nourish with farinaceous substances, and such as resist putrefaction. Afterwards, when the disease appears, he gives antispasmodics and opiates, but without much expectations from them. Thus of the spontaneous.

With respect to the inoculated, he lays great stress upon excision, and mentions, in a very judicious manner, the attention that ought to be paid to the direction and depth of the wound ; and the better to discover this, he advises inquiry to be made into the age, size, &c. of the animal. After dilating the wounds, suffering them to bleed freely, and binding them up till next morning, he applies *deliquescent butter of antimony*, as a caustic to them. He applies the caustic by means of a wooden probe, to the bottom of the wound, and extends it all over it, and part of the neighbouring skin. The reason he gives for not applying the caustic at the time of dilating the wound appears highly judicious ; the blood mixing with it dilutes it so much that its action is considerably prevented ; whereas when applied next day it destroyed the parts immediately to the depth of several lines, and over all he applied a blister.

After

After this operation he keeps the wounds open for 40 days with peas, gentian, or iris root, in the form of issues. Internally he exhibits the *volatile fluor alkali*^b in an infusion of elder flowers. The dose for an adult being twelve drops morning and evening. He does not administer this as a cure for the disease, but merely as a stimulant to produce sweat, &c.

He gives an account of eleven persons who were bitten by a mad wolf, nine of whom were brought to the hospital at Dijon, and accounts were sent to him from the country of the other two. Four out of the eleven died. M. le Roux confirms the observation, that mad dogs are shunned by other dogs.



14. *Some Observations on Hydrophobia by M. Baudot, to whom the Society adjudged a Share of their second Prize.*ⁱ

In speaking of his endeavours to remove the absurd fears of approaching persons bitten, he relates

^b Eau de luce, with the addition of oil of amber,

ⁱ Vol. ii. page 89.

relates the circumstance of a child being suckled by a she goat for three weeks, viz. untill the day that the goat died of the Hydrophobia. He relates several cases of cows bitten by a mad wolf; and that several infants were nourished by their milk, and the butter made from it. This they used with impunity till the day on which the animals died of the disease. He observes farther, that the human species, with impunity, cohabit together, and instances a girl who lay with a soldier till his death. The conclusion is, that the infection does not reside in the fluids of the body; but his opinion is, that it exerts its malignity on the nerves, and extends to the whole nervous system. He admits the saliva to be infected, and pertinently asks by what means this comes to pass? He thinks it may happen in three ways. 1st. From the particular affinity of the virus to the saliva, to the exclusion of the other fluids. 2nd. It may be communicated by the tainted nervous fluid. 3rd. He inquires whether there may not be a diseased secretion of the salivary glands arising from some change in their figure? He inclines to this opinion more than to the other two. He supposes the virus to act by irritating the nerves, and on this
 founds

founds his method of cure, which, according to his phrase, is to relax the nerves. He recommends ablution with salt and water, blistering plaisters, warm olive oil, and mercurial friction; and then gives a number of cases in which he thinks this proved preventive.

The author of this paper relates a noble instance of the patriotism and bravery of an inhabitant of Aligny, named Antony Thouveneau.

A mad wolf entered the parish near the entrance of the village, and bit a woman during the time of evening prayers. The inhabitants were then suddenly assembled by the ringing of an alarm bell to pursue the wolf. Antony Thouveneau, armed with a fusée, loaded only with small shot, closely pursued the wolf. The creature advanced; he fired, and put out an eye. At this instant Thouveneau ran for concealment behind a hedge, which was near, and to load his piece. Returning to the wolf, who advanced to the combat, he fired a second time, and hit it on the head, and hastily fled behind another hedge, to load his piece again; but as the wolf now took its direction towards the village, reflecting on the mischief it might produce, he resolved to
 expose

expose his life, rather than that the inhabitants should suffer. The animal turned on him; he presented, but his piece missed fire. He struck at it with the but end; but missing his aim the animal leaped on him, and fixed its foot on his breast. This courageous citizen, to avoid being bitten on the face, presented his right elbow, dashing it into the animal's open mouth, so that it was forced into its throat, and laid fast hold of it with his left arm. The combat was long. Thouveneau now found his strength greatly exhausted, when fortunately, at that moment, assistance arrived. He desired two men who came up to seize the wolf by the neck, asked for his knife, and with it cut the animal's throat. So firmly had the creature fixed his tusks into his arm, that they could not be disengaged without the assistance of a wedge. Our hero was wounded on the fore arm, yet he, and all the others, except two, recovered.

This author relates cases of persons bitten by a mad wolf in June, 1765, in the parish of Giri, near St. Bonneau. They all trusted to pretended specifics. The animal bit several dogs and cattle, all of which perished by the disease.

Peter

Peter Deplain died the 30th day from his wounds: one of the sons of Bosquet the 53rd: the widow Perronet the 42nd; and Edmée Thibaudat the 57th. The youngest son of Bosquet was the only one which M. Baudot attended, and this happened after the death of the others. According to our author he was cured after the first signs of the disease, by his method of treatment. He mentions a person named Maffelon, who died in 25 days from the wound.



15. *The Paper to which the other Part of the second Prize was adjudged is by Dr. Bouteille, of Montpellier.**

In this dissertation are discussed a variety of opinions, and several observations related, with some pathological and physiological remarks. Cases are likewise detailed, many of which cannot be interesting to the reader, and are foreign

* Vide part ii. page 129.

reign to our purpose. He confirms the observation, that persons may with impunity handle the saliva of other persons under the disease. He notices likewise, that the fear of water is not a symptom peculiar to the disease in brute animals, and mentions the instance of a mad wolf which swam several times across the river Argents; and of dogs which drank water.

This author believes in the accounts of the disease having returned at stated intervals for many years, and cites several *pretended* instances of it. So much credulity is displayed in this paper, that to avoid wasting the reader's time I shall pass it over. He returns so often to his favourite case of the *certain cure* of Elizabeth Bryant, by Nugent, that I presume the reader will not regret the omission, who, after careful perusal, is satisfied that this patient's disease was not *rabid* Hydrophobia. He relates some instances of persons bitten by a mad wolf, who, after thinking themselves secure, and refusing to continue the medicines, died, one 38 days from the bite, another the 44th, and a third three months after. This last was an old and feeble man of 60. He is
of

of opinion (and perhaps he is right) that the bite of a mad wolf is more dangerous than that of the dog, from its virus being more acrid, on account of its fierceness, hungry famished state, and its bite being oftener on the face and neck, and at the same time tearing deeply the part.



16. *Cases by Dr. Empereur.*^m

Three cases are related in this paper, where bites were received July 8, 1781, from a mad dog. The first was a man-cook, 30 years of age, bitten on the palm of the hand. He became affected the 20th of August. He vomited the whole night violently. Next day he had the same propensity, nauseating every thing he took. He expressed a great inclination to bite the by-standers a little before his death, warning them of their danger, but adding, he should not gratify this desire on them,

but

^m Vide part ii. page 222.

but should rather bite his own shoulders and arms. Immediately on his death, which was preceded for some time by an uncommon noise, his body was covered over with *livid* spots.

The next was a child six years old, named Castinel. He was bitten on the upper lip, near the nose, by which two of his teeth were displaced. He became affected on the 9th of September, and died on the 15th. He vomited the day before his death, and what was singular, his body became *cold* immediately after his decease. A circumstance singular also in the case of this child was, his being attacked with a severe *angina* in the interim between the bite and disease, which ran its course in the common way, and disappeared before *Hydrophobia* commenced.

The third, a boy ten years of age, named Joseph, was bitten in the arm-pit, and escaped. The author seems to insinuate, that being wounded through his shirt, the dog's teeth might have been wiped by this means, so that none of the saliva penetrated the integuments. He underwent indeed the same mercurial treatment with the other two, for more than
the

the space of a month, they both having undergone salivation.

We are next presented with an extract from a memoir, detailing the case of an advocate.ⁿ He was bitten by a small dog of his own, which he would not suffer to be killed; and six months after he took the disease. The only peculiarity was a vomiting of *black* blood, and the body turning *livid* after death. He drank freely, and called frequently for drink, and desired to be put into the bath before his death.

Then follows another case,^o shewing the evil tendency of the doctrine so long inculcated, that a person may take the disease *many* years after he has been bitten by a mad animal. A young man had been bitten three years before, and after suffering daily inquietude, and experiencing much misery, with loss of appetite, flesh, and health, he came for advice to the relator of this case. He is described to be in a most wretched situation, questioning the doctor, and doubting whether he might not take the disease at any *future* period howsoever *distant* from the accident.

After-

ⁿ Vide part ii. p. 234.

^o Vide part ii. p. 241.

Afterwards we find related^p the case of a young mason, 16 years of age, who was bitten on the leg, and who took the disease on the 56th day. It appears that he had some slight indisposition from the 44th. This author however has no opinion of mercury, in which I perfectly coincide with him.



17. *Memoir by M. Bonel de la Bragereffe.*^q

This author gives an account of six persons and five animals, viz. a dog, a cat, a bull, and two cows, bitten by a mad dog. The six persons recovered, but the five animals died, from two to three weeks after the accident. The cows survived four days after the disease appeared; the bull not altogether so long; the dog three days, and the cat 30 hours: and what was singular in this last, it never, during the disease, attempted to bite. The dog which committed these ravages had previously bitten four other persons. They took no precaution
to

^p Vide part ii. p. 242.

^q Vide part ii. p. 255.

to prevent the disease, and three of them died.

The same author believes in the utility of mercury. He mentions a pig being bitten, which did not take the disease till the end of five weeks, a period longer than is usual for quadrupeds. Another pig was bitten, and in the interim was killed and eaten, without any bad consequences. He notices two other pigs that died in less than six weeks. This author is of opinion, that Hydrophobia has been cured, and cites Nugent's case of Elizabeth Bryant, and that by Wrightson,^r as proofs. In this he will not find every reader to coincide with him.

He relates the case of a boy between five and six years of age, who was bitten the 10th of July, 1777, and was attacked with the disease on the 9th of September, 1778; distant 14 months. Our author saw him on the 10th, 1778. He died in 55 hours from the attack.

A poor man, an ideot, bitten by the same dog, died in three weeks. More than ten animals became mad; some in two, some in three, four, five, and six days from the bite.

A cow

^r Vide Transf. of Coll. of Physicians, Lond.

A cow died 36 days from the bite, and suckled its calf; and an infant took its milk, without any bad consequence, till the day of its death.

M. Bonel likewise details the case of a man, aged 22, who was bitten in the leg and hand in 1777, and was attacked by the disease in the middle of July, 1778, eight months after the accident, and died in three days. What is worth notice in this case is, that his attendants received his *breath*, put their *fingers* into his *mouth* now full of saliva, and were even *scratched* by his nails, without any ill effects.



18. *A Memoir by M. Matthieu, Surgeon of Conze, near Linde, in Périgord.*^s

This author does not admit of spontaneous Hydrophobia in man, and is of opinion that the cases cited by Andry and others may be referred to other diseases. In an instance given of it by Sauvages, M. Matthieu seems properly enough to refer it to passions of the mind,
caused

^s Vide part ii. page 295.

caused by insult offered to the patient (a young woman) by a young man, which threw her into a violent fever and delirium, with a dread of water. The case that M. Pouteau relates he considers of the same nature. It was merely a case of mania, suddenly excited in a weak man, in consequence of anger.

M. Matthieu seems properly to distinguish between Hydrophobia as *symptomatic*, and Hydrophobia as a *primary* disease. To the latter he gives the common name of *Hydrophobia*, which, by the French, is styled *la rage*. He says that the disease sometimes exists without the least dread of water, of which he gives an instance in a boy of 13 or 14 years of age, in the Hotel Dieu, at Montpellier. The bite was given by a dog, and the wounds were speedily cured, when he left the hospital, but returned in three weeks after with the disease. He was tranquil, and cheerful as in health, till the moment of the fits, which were violent, and which he foresaw time enough to allow himself to be bound. He swallowed to the last moment, and without repugnance, whatever drink was offered to him. This author mentions a man of about 50 years of age, who likewise had the disease without any dread of water.

water. M. Matthieu *recommends* mercury, and cites several authorities in favour of it. He thinks it not only a prophylactic, but a cure, and produces a number of cases to prove the truth of this position.



19. *A Dissertation on Rabies, by D. Metzler.*

This author is of opinion, that the disease can only arise from a wound inflicted by a rabid animal. He divides the disease in the dog into three stages. He says, among other symptoms, that in the first stage this animal refuses both meat and drink.^u In the second stage that he loses the recollection of his master. Metzler affirms, that he has even known a dog, who, at this period, did not *notice* the *discharge* of a gun: the dog, according to this author, now refuses drink. At this time he runs forward; dogs fear, howl, and shun him. He bites indiscriminately whatever comes

M m

in

^t Vide part ii. page 329.

^u This has been fully disproved in the preceding pages.

in his way. His third stage comprehends but few symptoms: exhausted now, he can scarcely move; falls down, and dies convulsed.

Our author asserts the disease to be communicable only by the saliva; and in proof of this he relates a case which had lately happened where a woman in the eighth month of pregnancy was bitten on the little toe by a cat. After 21 days she died hydrophobic. The physicians and surgeons, through *fear of infection*, declined giving their aid. The neighbouring rustics more humane, and with more resolution, successfully performed, with a common table knife, the Cæsarian operation, and escaped without infection. He is of opinion, that the best prophylactic consists in destroying the poison in the part bitten by the actual cautery, in preference to the potential, or to excision. He reprobates all dependance upon internal medicines as prophylactics. The application of the actual cautery he urges by many arguments and proofs from authors ancient and modern.

In Germany it is in such common use, that in the smiths shops instruments are kept of different shapes, for more commodiously burning the part. To these the people resort when
they

they suffer accidents from rabid dogs. So much do they rely on this practice, especially when done by red-hot iron, that they keep a piece in form of a key for this purpose in many shops, which is held in great veneration, under the name of *St. Hubert's key*. In our country, adds he, the priests do not suffer this key in common hands, but exclusively keep it in their own possession, exercising this office with it, as occasion requires, not without great emoluments, by which means the poorer people are excluded from its benefit.

Metzler relates the history of a woman named Mary Ann Proghammerin, 26 years of age, who on the 26th of December, 1782, was severely bitten by a mad dog near the ankle. She returned home with as much expedition as her wound would permit; sent for a surgeon, who washed and deeply scarified the part, and sprinkled it full of cantharides, applying a plaister over the whole. Next morning the same process was repeated with the addition of *St. Huberts key* made red hot. The wound was kept open for six weeks.

On February 24, or nearly two months from the accident, after considerable uneasiness occasioned by the sudden illness of one of her family,

family, she felt a pain in the bitten parts, stretching towards her hip. This increased, and on the 26th she was obliged to keep her bed. On the 28th deglutition became greatly impeded, accompanied by intense thirst, and a troublesome hawking of viscid saliva. March the 1st her complaints increased; inability to swallow, with excessive thirst followed, to mitigate which she sucked her husband's fingers, previously moistened in cold water. In this way she felt no horror at the sight of liquids, though now unable to swallow either fluids or solids. She was greatly affected when any person approached her bed; it was attended not only with increased respiration, but almost instant suffocation. Her understanding remained perfect, she wished for a physician, and the same evening the author of this narrative was sent for. Being seized with a violent exacerbation, she repeatedly entreated her husband to end her misery by smothering her with the bed clothes, adding, that it was his interest not to refuse her last prayer made with a view to preserve *himself* from the *disease*, which otherwise he might receive from her.

The wretched husband yielded, through the power of terror, and had nearly executed this
rash

rash action when the doctor entered, who immediately liberated the dying woman, by removing the clothes in which she was confined, opened the doors and windows, applied volatile alkali, sprinkled her with cold water, and thus recovered her from suffocation. While the affrighted husband related the reason of his attempting this deed her reason returned, and she confirmed her husband's words, and most earnestly implored the doctor's assistance, more especially as she was in her third month of pregnancy. Her pulse was unequal and tremulous; yet he ordered V. S. to 14 *ounces*, and he observed, that the blood had a *healthy appearance*. At the same time he administered four grains of tart. emet. in order to excite nausea and vomiting. Although the dose was repeated no vomiting took place. The cicatrices were now re-opened by deep scarifications, and filled with cantharides. An emollient clyster was injected; a grain and a half of opium ordered to be given every two hours; the wounds to be filled with mercurial ointment, and the tepid bath to be used.

Four stout men, with two surgeons, were left to guard her, to whom proper cautions
were

were given that they might avoid *infection*, while the doctor returned home in the evening, to order the necessary medicines. She passed a restless night. No sooner had she entered the bath, but a violent exacerbation seized her, deglutition became totally impeded, difficulty of respiration increased, with fever, a parched tongue, and an accumulation of saliva, which she ejected incessantly on the attendants. Frightened at this circumstance they snatched her from the bath, and threw her into bed, retreating with precipitation to the different corners of the room. One of the strongest, with more courage than the rest, laid hold of, and bound her. The convulsions forced open the orifice in her arm, which none of them, through fear, attempted to bind. The profuse hæmorrhagy soon hastened her death.

In some additional observations which the author subjoins, we are informed, that in different parts of Germany no superfluous number

v It will appear from this and other cases collected how prevalent the erroneous and dangerous opinion concerning the capability of the human subject of propagating the disease still continues, and to what horrid practice it leads.

ber of dogs are permitted to be kept, and even the number allowed pointed out; by this means accidents seldom occur in these places. Their owners likewise are enjoined to muzzle them, thereby insuring to the inhabitants a farther security.

This author places no confidence whatever in mercury as a specific. On the contrary, he alludes to great variety of instances where it was liberally given, yet the patients died under the usual symptoms. He brings forward several proofs of human saliva *not being infectious*. The history above where the husband wetted his fingers that his wife might suck them, and his roping the tough saliva from her throat affords a strong example. He testifies that both he and a surgeon were besmeared with the blood and saliva of a hydrophobic without the smallest bad consequences. Neither the husband who slept with his wife in the ordinary familiarities of that situation, nor those who attended during the disease, tho' copiously besmeared with saliva, in another case of Hydrophobia were affected.

A mad dog rushed on a flock of oxen, bit ten of them, and in three days they took the disease, ran about constantly lowing, suffering
under

under dreadful convulsions, and every one perished. Some other oxen which escaped the bite continued in the same stalls with the infected uninjured. Another example of the same kind lately happened where an ox was bitten by a mad dog, and took the disease; the animal remained in the same stable with others without communicating infection; neither did the owner suffer though he frequently thrust his hand into its mouth in administering remedies. Those physicians therefore, who, through a mistaken notion of the infectious nature of Hydrophobia in the human subject, carefully enjoin the family where such misfortune has happened to burn the furniture of the room, add only one loss to another by their erroneous admonitions. Metzler asks, and with great propriety, whether those authors who affirm the communication of the infection by contact, as kissing, &c. be certain of the fact?^w He answers in the negative. Facts stand unquestionable in direct contradiction.

The

^w Cœlius Aurelianus, Aretæus, Palmarius, Schenkus, Mathiolus, Pierius Valenianus, Mathæus de Gradibus, Meischnerus, Surius, Salius, Hildanus, and Baccius, all hold this opinion.

The sting of a bee or the wound made by the beak of a duck has occasionally produced death. What then? Must we conclude, says he, that every sting from a bee, or every scratch from the beak of a duck will equally prove deadly? Hydrophobia therefore does not infect either by sweat, contact, blood, urine, nor even saliva, unless through the intervention of a wound; for we have innumerable examples where domestic animals have died rabid, and have been eaten without the least bad consequence. This author affirms, that the saliva of a dead rabid dog becomes equally innocent. An opinion which, as far as it concerns this genus, ought to be received with hesitation.

To Dr. R. HAMILTON,

DEAR SIR,

AS your work on Hydrophobia embodies the facts of modern times, and many of those described by ancient writers, I am for contributing my mite towards enabling the curious reader to refer to several other ancient writers, where cases of Hydrophobia are to be met with. In addition to *Ætius*, *Cælius Aurelianus*, *Celsus*, *Hildanus*, and many other authors whom you have mentioned, I send you the following list of works with their dates.

Remberti Dodonæi Observationes. Herder-
vici, 1621.

Tulpæ Observationes. Amstelodami, 1641.

Pauli Rencalmi Observationes. Parisiis,
1604.

Zacutus de Principium Medicorum Historia.
Lugduni, 1641.

Amati Lusitani Centuriæ, 1557.

Observationes Joanni Chiffletii. Parisiis,
1712.

Decades Disputationum Jon. Jacobi Genathii. Basil, 1621.

Some

Some of these are included in the *Observationes Medicæ Rariores*, Joannis Schenckii. Lugduni, 1644, a work which contains quotations from upwards of 60 authors on *Hydrophobia*, more than I have mentioned, or are noticed in your volumes, and of which the following are the principal:

Miraldus *Memorabil.*

Cardanus

Scaliger.

Clusius *Annotation Gariæ Aromat. Hist.*

Pareus.

Nicolus.

Plutarch.

Strabo.

Heroditus.

Diodorus.

Forestus.

Rumbaum *ad Scoltzium.*

Wierus.

Fernelius.

Capivaccius.

Fracastorius.

Aretæus.

Wolp.

Joam. Mathiol. *de Grad.*

Galen.

Mathiolus

Mathiolus Commentar. ad lib. 6, Dioscoridis.

Joan. Pierius Valenianus.

Palmarius.

Surius.

Salius.

Alexand. Benedictus.

Isaius Meischnerus.

Niphus.

Albertus Magnus.

Amatus Lautonus.

Avenzour Theizir.

Valleriola.

Vidius.

Petr. Salius.

Mercellus Donatus

Alzaharavius.

Avicenna.

Nicolaus Florentinus.

Jac. Greviorus.

Thom. a Veiga Comment.

Gesnerus Histor. Animal.

Ferdinandus Ponzettus.

Rafis.

Gesnerus Epistol. ad Cossnam Holzachium.

Auratione D. Georgii Palmæ.

Dioscorides.

Aëtius.

Aëtius.

Philosiratus in vita Appollonii Tyanci,

Plinius Nat. Hist.

Aquivius.

Gemma Cosmerit.

Coelius Rhodiginus.

Joan. Jovian. Pontanus,

Scribonius Largus.

Alexandrinus.

Your's very truly,

THOMAS GIRDLESTONE.

July 12, 1798.

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To the above may be added the following. I copy them as presented to me in Foot's Essay.\* To give a complete list of every author on the subject might be desirable, as well as useful, but it would be a labour not only difficult for me to execute, but even, in my situation impracticable. These however, and such as are quoted in different parts of this work, will be found the most useful in conducting the inquirer or student in his researches.

*Cata-*

\* On Bite of Mad Dog, page 85.

*Catalogue of Authors on the Hydrophobia, in Portal's Tableau Chronol. p. 824, tom. 7, and taken by him from Draudius's Biblia Classica.*

Bravius, 1551. Salmanicæ.

Mercurialis Hieronymus, 1580. Bataviæ.

Baccius And. 1586. Romæ.

Varifmannus, 1586.

Mancinellus Afcanius, 1587. Venet.

Abbatius, 1589.

Bauhin, 1590, 1591. Montbelliard.

Roscius, 1606. Basil.

Caiffon, 1609. Aix.

Codronchius, 1610.

Sprachman, 1613. Lond.

Caiffan, 1616. Paris.

Humel, in 8vo. Catalogue du Burette.

Caranta, 1623. Saviliani.

Aromatarus, 1625. Venet.

Bonaventura, 1627.

Stegel, 1640.

Severinus, 1643. Bataviæ.

Gockelius, 1679. Augsburg.

Loffius, 1682.

Ettmuller, 1685.

Albinus,



Albinus, 1687.

Wedel, 1695.

Eyselius, 1705.

Fetzer, 1733.

Schulze, 1740.

Olivier, 1743.

Boemar, 1745.

Sauvage, 1749.

Gallarati in Milano.

To the above I shall add another, *Observations on the Effects of Mephitic Vapours upon the human Body, on drowned Persons, on still-born Children, and on Canine Madness, &c.* by M. Portal, Professor of Anatomy, &c. edit. 6. Paris, 1787.

POST-

## POSTSCRIPT.<sup>y</sup>

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Dr. Babington's second patient, William Yates, a young man, bitten by a yard dog in both hands, the 30th of Aug. 1784.<sup>z</sup>

This happened not far from Guy's Hospital. The patient was brought to it. It is worthy of remark, that the patient was in the daily habit of feeding the dog, and of familiarity with him, and never observed him in the least indisposed till the moment he received the bite. The wounds were extremely slight.

Pro-

<sup>y</sup> In order to give the reader a view of the latest published cases, I stopped the press till I sent to town for the work in which the two following are detailed, and which did not come to my knowledge in time for their insertion in their proper place, among the epitomised cases. The work has but just made its appearance.

<sup>z</sup> Vide Med. Records and Researches, selected from the papers of a private Medical Association. p. 117. Lond. 1798.

Prophylactic. Ormskirk medicine exhibited in the usual way.

Symptoms. Friday, October 15, *chilly* and uncomfortable; pain in right arm and shoulder, but uncertain whether first felt before or after chill. Saturday. Drooping, and low spirited. Sunday. Much as the day before. Monday. Scarcely able to work. Tuesday Morning. Ate little breakfast; quitted his dinner; took no supper; passed this night restless. Wednesday, half after four, P. M. brought to hospital; put to bed, where Dr. B. visited him, and found face rather flushed; looks were wild, yet he was perfectly rational. Speech interrupted by sudden convulsive sighs. "He was so particularly susceptible of cold air, that it was with much reluctance he suffered us to feel his pulse." Aversion to drinking; said it gave him pain to swallow, yet confessed he was thirsty. Pulse full, rather frequent. 7, P. M. Pulse 92: convulsions on attempting to drink. Thursday. 1, A. M. Outrageous; talked of the dog; sung;<sup>a</sup> spat  
N n fre-

<sup>a</sup> This symptom was doubtless the consequence of the opium. Such has never been mentioned in any case of the disease, which I have perused, as a genuine symptom.

frequently, and to a great distance, but shewed no disposition whatever to be mischievous."

4, A. M. More composed; ejecting from the stomach quantities of a chocolate-coloured liquor: frothy saliva in great abundance in mouth; eyes fixed, of a livid red colour; mouth open; countenance flushed; respiration slow, laborious; pulse scarcely perceptible. 7, A. M. Death.

Treatment. Wednesday. 4, P. M. Warm bath for 25 minutes on coming to hospital; could bear it no longer: on rising from bath convulsive fit; sunk instantly to bottom of bath, and would have been suffocated, but for assistance at that moment given. Let blood to 14 ounces directly after bath; no appearance of inflammation, nor buffy coat on surface after coagulation. Mercurial friction to two ounces of unguent on legs and thighs:  
five

tom. Melancholy and timidity mark the complaint. I have repeatedly observed the same proneness to singing from large and reiterated doses of opium. The songs however are of a melodiously plaintive kind, and peculiarly distressing to a sympathising and commiserating bystander. These instances were fever, and the practice was Brunonian. I remember no recovery. They took place in the summer 1781, when opium first began to be largely exhibited. I saw some of them in the army.



five grains of strained opium in bolus; soon after another dose of 25 grains: blister to breast. 7, P. M. Repeated opium to 30 grains, with 10 grains of calomel. 10, P. M. Same quantity of opium without calomel. A quarter past 11, P. M. No effect from opium; same dose repeated. Thursday. 1, A. M. Same quantity again repeated. "Soon after this he became outrageous; talked of the dog; sung; tossed himself from side to side with great violence." 3, A. M. Same quantity again repeated. Total opium in eleven hours no less than 180 grains, without benefit, and without sleep.<sup>b</sup>

Dissection. Vessels of D. and P. mater unusually distended with blood, but not to an extreme degree. Between D. and P. mater, and between processes or folds of former, a little fluid, appearing to have some consistency.

Lungs----Turgid with blood particularly right side.<sup>c</sup>

Liver

<sup>b</sup> This trial is a full confirmation of what was advanced at p. 71.

<sup>c</sup> This turgescence is not to be attributed to active inflammation, but to congestion or infarction from irregular spasmodic action in the heart, &c. (Vol. 1, p. 246) because

Liver----Superior convex part of great lobe of a shining blue: gall bladder full of bile.

Small intestines-----External surfaces appeared slightly inflamed.

Trachea---Membrane lining its internal surface unusually red.

No rupture of vessels any where; no deficiencies, nor preternatural quantities of fluid in any cavity.

Stomach---Sound. Heart found.

Diaphragm without inflammation: other muscles of respiration without inflammation.

Axilla---No enlargement of glands. All other parts natural.

It is to be regretted, that the distance between death and the dissection has not been noticed. This omission is material.



Dr. Wavell's patient, Robert Pick, 23 years of age, bitten by a spaniel in the right hand, on the 6th of April, 1795.<sup>d</sup>

This

because the blood would otherwise have shown, on coagulation, the common inflammatory appearances. Instead of this it was healthy, and without the buffy crust.

<sup>d</sup> Vide Med. Records and Researches, selected from the papers of a private Medical Association. p. 139. Lond. 1798.

This happened at Barnstaple in Devonshire. The dog belonged to the family. He lapped water afterwards; hence was not considered as mad.

Prophylactic. Nothing done to the wound; no suspicion entertained.

Symptoms. June 8. Remained well till ten, P.M. this evening: cold shivering, like what he had formerly experienced from ague: night passed without sleep; could not swallow. 9th. Could not swallow at breakfast, yet entertained no suspicion of Hydrophobia, but added, that he would have thought his case Hydrophobia had he not seen the dog afterwards repeatedly drink water. This morning was melancholy, dejected; countenance appeared distressed; informed Dr. W. that four days ago he first felt numbness, with pricking sensation in right arm, extending to shoulder: sensation increased since he played at fives, a game he lately exercised himself in, and was much heated.<sup>e</sup> Complained also of  
 swell-

<sup>e</sup> On examining cases the first attack will appear frequently to occur, after violent exercise of any kind, or after grief, or agitation of mind. Smith (Case VI.) took the disease after a camping match. M. Proghammerin

swelling in throat preventing deglutition: attempted to swallow; followed by convulsions: vomited this morning considerably a viscid greenish phlegm.

Bowels natural; urine copious and natural; pulse 108: tongue red in middle, with sides moist and florid: no inflammation in tonsils or fauces. 4, P. M. Pulse 120, and small: very deaf; thirst great. 10th, at 8, A. M. Last night

hammerin (page 531) took it after suffering some family vexation, and in the present instance it was the consequence of *active* agility. The boy Brown (Case XLI.) fell ill after violent play, and so have others. To explain this, I would say, that the *qui sciet* time peculiar to the poison being nearly completed, the violent agitation affects the circulating mass in general, inducing a change of action, giving acuter sensibility to every vessel by which the action of the absorbents, in common with others, are changed. The noxious particles, till now apparently at rest, are laid hold of more readily, and conveyed to the heart, disturbing its functions. This violent agitation of mind or body, or both, occurring near the time of *accession*, according to the general law of the poison, only hastens the disease a day or two or so, but is no other way connected with the complaint. I infer this from the many instances recorded, where agitations equally strong, at a greater distance from the common time of the appearance of the disease, have had no effect: hair-breadth escapes from death by ship-wreck, the operation of nitrotony, violent catarrhal affections happening after the bite, but more distant from the *critical* period, did not induce it: when this time arrived they took the disease and died.



night sleepless; sensibility to cold air extreme; opening a door or window created a sense of suffocation: every symptom increased: pulse much quicker and weaker; tongue dry: spasms increasing on the least motion, on persons entering the room, or approaching towards him. Any one's hand coming near, such as by adjusting his night cap, &c. gave inexpressible uneasiness. 3, P. M. Every thing worse; refused to make another effort to swallow, declaring that the last time he swallowed a bit of bread it produced "so dreadful a sensation in his throat, extending from his jaws to his stomach, that to attempt it again would occasion his death." Deafness so great, that the noise of a carpenter's hammer in the next room did not affect him: advised to change his chamber for a larger; dreaded the cold air in removing though only ten feet of gallery to cross, saying it would kill him: motion of the air from making his bed affected him, inducing spasms; lifting him up in a chair produced the same; for on moving it "he sprang up, and with a loud shriek flew to the other end of the room, with a violence, wildness, and agitation not to be described." Motion of dust in the room distressed him, trying

with

with his hands to push it away: every thing progressively worse; eye red; wildness and horror in aspect scarcely to be conceived; pulse quick, tremulous, hardly to be felt: saliva copious; constant spitting; could not bear a handkerchief to wipe his face: saliva adhering about mouth; “at times indeed, though evidently with great reluctance, he drew the phlegm from his mouth with his fingers, and with a motion rapid as thought, and a vehemence to be conceived by those only who have seen similar instances, he threw it against the wall.” Vomiting of bilious matter recurred, sinking apace: called now for a glass of brandy; took it in his hand with eagerness; “ejaculated a blessing on his master and mistress, threw the brandy into his mouth, and swallowed it at one gulp, as if forcing it down with every possible violence, and instantly fell back dead in the chair.”

Treatment. Four grains opium in pill, to be repeated every hour; blister to throat; laxative enema producing two stools; blisters behind the ears at patient's request; enema repeated, with opium in it ten grains. No ease from opium; 54 grains taken in the last 25 hours, besides the opiate clysters.

Dissec-

Dissection---None made.

N. B. Rational throughout; nor did he consider his disease as Hydrophobia; and hence his sufferings were the genuine effects of the poison.

The dog who bit this patient appeared diseased for two or three days after, and *did*, it seems, *refuse* food at this time, though not water; was snappish and irascible; attacked other dogs, who fought with him freely. After having bitten the patient, ran away; was lost for a day and half: during this killed several lambs; was observed to eat part of one: was secured by a neighbouring farmer, and brought back; then confined. Water now offered him; ran to it, lapped with eagerness and apparent ease, continuing to do so when he was last seen. Died early next morning. Meat was thrown to him before death; seized it greedily but did not eat; attempted to hide it in the straw.

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A communication by Mr. A. Cooper, surgeon, to Dr. Babington,^f leads us to doubt
whether

^f Vide Med. Records and Researches, &c. page 136.

whether the saliva of a dead rabid dog can induce the complaint. In the instances which he tried it failed. Metzler^s was of opinion, that no disease would follow from inoculation with saliva from a dead rabid dog, but he adduces no examples in proof. Mr. C. made his experiments with care, and they failed; yet till they be oftener repeated I am unwilling to decide in so hazardous an affair respecting its innocence. This is not meant to deter from dissections of rabid dogs; it is intended as a caution merely for the dissector or others, in handling such saliva. Should my doubts be even ill founded, they can do no harm.

Mr. C. inserted two or three drops of saliva, in its recent state, taken soon after the death of a rabid dog, from the point of a lancet under the skin of the inner part of the thigh of a dog, a pig, a fowl, and a rabbit. "The dog and fowl were kept confined for nine weeks, and the pig seven, but without any appearance of Hydrophobia." Twelve months afterwards the dog was in good health. Nothing could be concluded concerning the rabbit;
it

it was accidentally killed four days after the experiment.

Another proof is afforded here of what has^h been already delivered,^h that the distance from the bite to the attack in the dog tribe is regular, and has its law. The dog from which these experiments were made, began to droop on the 25th day from the bite, and died on the 30th. He was tied up immediately after being bitten, which was by a strange dog, who ran off, and was never heard of more. This was in August, 1788.

The appearances on dissection observed by Mr. Cooper were, an inflammation of the internal membrane of the stomach,ⁱ with several small clots of blood effused both within the stomach, and in the cellular substance, connecting the mucous coat to the muscular. A large circular spot of inflammation was discovered in the pharynx. Mr. C. has met with the same appearances in several other dogs; hence the conclusion formerly drawn is strengthened, that the stomach, as well in the canine as the human tribe is much connected
with

^h Vide vol. 1, page 23 and 222.

ⁱ Vide vol. 1, p. 28 and 224 for similar appearances.

with, if not the principal feat of the disease.
Mr. C. has omitted to mention the state of
the heart, great vessels, and lungs.

END OF VOL. II.



ANNOTATIONS.



Vol. I. *page 33, line 2 from bottom.*

“ I shall mention as the next,” &c. Nugent seems to have entertained the idea of local irritation, and nervous affection. The stimulus of the poison, he thinks, impresses a new morbid affection on the solids of the part bitten, and is thence propagated to the system;^y but he loses himself in a theory in proceeding in his explanation, not necessary to be here examined, as it is founded on mistaken notions of the animal œconomy.

Mead, previous to this, entertained an idea not dissimilar. He could not reconcile the speediness with which the poisons of some
noxious

^y Vide Essay on Hydrophobia, p. 127, Lond. 1753.

noxious animals acted with the notion of the blood being primarily affected. The course of circulation, he thought, being too slow, he referred it therefore to the nerves.

Vol. I. page 111, line 3 from bottom.

Dr. Clarke divides this disease into two species, one he denominates idiopathic, the other symptomatic. The former admits of a cure; the latter, he thinks, cannot be cured. It arises from a lesion of nerves and tendons, occasioned by wounds of various kinds, such as pricks in the feet from nails, or fish bones; splinters of hard wood running into the feet and hands; from cuts of glass bottles in the soles of the feet, or about the toes; from pricks of swords; gun-shot wounds in the extremities, especially about the feet and ankles; from compound fractures with splintered bones; from amputations of the arms, legs, fingers, and toes.

During the spasms the patient experiences considerable difficulty of deglutition, but feels no aversion to fluids as in Hydrophobia. The
disease

* Vide Treatise on the Yellow Fever, page 129.

disease never appears after the 14th day from the injury; the 8th or 9th, or the 13th and 14th the most common time. The punctures or cuts are generally healed before the disease appears, and when it proceeds from an amputation the stump in general looks well till this time.

In England however we are more successful than Dr. Clarke has been in Dominica; for this species occasionally admits of a cure. Dr. Currie cured it in one instance at Liverpool,^a by bark and wine, imitating the practice of Dr. Rush. That disease arose from a wound in the hand; it was nearly healed (the distance from the time of receiving not mentioned) when the rigidity of the jaw took place. Deglutition was extremely impeded; and convulsions followed not only the attempt to swallow, but the sight of fluids. Perseverance, and watching a favourable moment when the relaxation lessened overcame the difficulty, and sufficient wine was gradually swallowed. The similarity of this symptom to Hydrophobia could not fail to strike Dr. C. He mentioned it to Dr. Percival, who noticed it in his paper
after-

^a Vide Med. Reports, &c. edit. 1, App. No. 1, p. 9.

afterwards published on this malady.^b Notwithstanding this similarity in one symptom it cannot establish a similitude of disease. They are as different in many material symptoms as they differ in origin.

Vol. I. *page 159, line 4 from bottom.*

“Scribonius Largus.” This practitioner, who lived under Claudius, was in possession of a famous nostrum for Hydrophobia. He received it from his master, Apuleius Celsus. The composition was hot spices and opium. Cicily was in those times notorious for mad dogs, and Apuleius Celsus, the real author of the composition, used annually to dispose of quantities of it in this island.

Ibid, line 3 from bottom.

“Palmarius.” The famous nostrum which goes by this practitioner’s name, was extolled by him above all others which industry had heaped together, and credulity received. It was composed of the leaves of twelve plants,
viz.

^b Vide Essays, vol. 2, page 366, edit. 4.

viz. rue, vervain, sage of virtue, plantain, polypody, common wormwood, mint, mug-wort, baum, betony, St. John's wort, and of the lesser centaury. Equal parts of each were reduced into powder, and mixed together. The dose was a dram daily; but when late in application, either for prophylactic or cure, it might be employed in double or treble the quantity. It was equally successful as a prophylactic and a cure.

No case of disease, according to him, could resist its virtues, two only excepted: the one where the injury had been received in any part of the head or face above the mouth; the other where the wound, previous to its application, had been washed with cold water.

Palmarius however was not the inventor of this, though it goes by his name: he received it from James Sylvanus, Count de Pyrou.

Ibid, page 160, line 4.

“Pimpinella.” It was one of King Henry the second's foresters (game-keepers) who on his death-bed discovered it to his physician Fernelius; not King Henry himself. The history of this noted specific is given us by Pal-

O o

marius,

marius, who received it from Fernelius who was his preceptor. It was to be eaten as a fallad.

Vol. I. page 228, line 6 from bottom.

“No serious evil followed.” The late Mr. J. Hunter affords a complete refutation of this ill-founded opinion. He wounded his hand while dissecting a patient who died of Hydrophobia. It is well known he lived long after without experiencing the disease, and died of a very different complaint.^c

Vol. I. page 250, line 7.

“Create the highest alarm.” The late J. Hunter felt with severity the effect of apprehension of rabid infection. He imagined, with many others, the possibility of communication of rabid virus from man to man. In dissecting a person who died of this disease, he cut his finger, and the impression wrought so forcibly on his mind, of the possibility of being infected through

^c Vide Home's Life of J. Hunter, prefixed to his posthumous works, page 53.

through the wound, that it brought on a violent fit of that complaint, which, some years afterwards, cut short his valuable life.^d

Vol. I. *page 280, line 18.*

According to Plenck saliva is inspissated by a small quantity of mineral acids; but by a large quantity it is dissolved.^e He likewise affirms it to be dissolved by aerated alkali. He does not say how he came by this conclusion, or whether it is drawn from human saliva, or from saliva in general.

It does not altogether accord with the experiments of M. Hapel on the saliva of the horse; for not aerated, but caustic alkali is asserted by him to dissolve this fluid. Neither does Plenck say whether his experiments were made on pure saliva, as flowing from the gland, or saliva collected after mixing with mucus from the membranes of the mouth and fauces.

From what follows it would appear to be the latter, because he expressly affirms volatile
alkali

^d Vide Home's Life of J. Hunter, prefixed to his posthumous works, page 53.

^e Vide Hygrology, page 71.

alkali to be discovered by mixing the saliva either with caustic alkali, or with lime. Hapel, on the other hand, denies the presence of volatile alkali in pure saliva, though by its colour, and its effects on acids, mineral alkali is evidently detected. Plenck says that saliva readily putrifies in warm air.

With respect to putrefaction of saliva M. Hapel's experiments coincided with Pringle's. The former found it to resist putrefaction for several weeks, placed in an air pump in pure air; but at length it yielded to the septic process. Plenck draws the same inference. The constituent parts of saliva, according to him, are water, albumen, ammoniacal salt, and animal earth. Hapel again affirms it to be a mucilaginous watery fluid, which is formed of a proportion of air, oil, and water, of the fixed mineral alkali, and of animal earth, or earth of bones.

Hapel found pure saliva lighter than distilled water, for it swam in it. The specific gravity of the saliva used by Plenck was heavier than water. Distilled water not being mentioned leads to the conclusion, that it was heavier than water without distillation.

The

The different results of these philosophers might proceed from the difference in saliva employed; the one using *pure*, the other saliva *mixed* with the mucus of the mouth. Saliva, says Plenck, corrodes copper and iron. Does not this argue the existence of oxygen? Does this oxygen proceed from atmospherical air mixed with the saliva of the mouth?

Vol. I. *page* 80, *line* 23. "Referable to the nerves"----*Ibid*, *p.* 84, *line* 11. "Exerts its violence on the nerves"----Vol. II. *p.* 1, *line* 11. "Seated principally in the nervous system."

I have brought these three passages together to draw the reader's attention to the symptoms which have in general been termed *nervous*. I have followed here the commonly received pathology; but may it not be asked with some propriety, how far the *blood* is concerned in producing these symptoms, and what share the heart and arterial system have in giving rise to them.

Some light I think is thrown on this subject by comparing the symptoms in the case of a
late

late eminent anatomist with the dissection. These would have been styled nervous, and the nerves would have been denominated the chief seat of the disease, had not the inspection led to a different conclusion. Who would not have affirmed the rotatory motion, false perception, and other illusions, the increased sense of taste, hearing, and alteration in vision, whether in dimness during the exacerbation, or change of colour in luminous bodies, during convulsion, to be referable to the nerves alone, without looking farther for a cause? The accurate history given by Mr. Home of this complaint, compared with the dissection, clearly shows the primary cause to be referable to organic changes in the heart and arteries. Partial distribution of the blood, and changes arising from thence, produced what followed during a fit. The affection of the nerves was doubtless secondary only. What the real state of these organs was when the first fit came on, which was from vexation of mind, cannot be told, but it is probable, that as happens in diseases where the structure of parts is deranged, the structure

† Vide Home's Life of J. Hunter, prefixed to his posthumous works,

ture had already felt some injury, though too small to give uneasiness, till, by an inordinate action or exertion in the heart, or by a sudden and temporary loss of power to perform its functions, the injury became manifest. We speak of terror, &c. acting on the nervous system: is it not from the *sanguiferous* that the effects arise? Change suddenly the current of the blood, and you produce those symptoms called, in common language, *nervous*.

I throw out this hint merely as expressive of my doubts, whether we are correct in our pathology in referring such symptoms *always* to the nerves. We swallow opium or hemlock, or drink some laurel water; symptoms arise bearing some similarity to each other, and we refer them immediately to the nerves: but do not these substances enter the blood by the medium of absorption? and do we not know from experiments^s how small a particle of noxious matter entering the blood will produce most violent effects? Here I would say, pursuing the idea of the above anatomist, that the life of the blood is instantaneously attacked and suffers, the moving fibres become thence affected,

fect, the heart is convulsed, and symptoms, receiving the name of nervous, speedily follow.

The nerves are a part of the system, like all other parts, formed from the blood; they constantly receive their supply from this parent fluid: whatever that emanation may be, called nervous fluid, it must in some measure be connected with the blood, being a branch only from the stock. Deny parts of their due proportion, or diminish the blood in them, the nerves feel the deficiency, and their functions become deranged. This may take place instantaneously from a sudden deficiency, or gradually by the slow advancement of a chronic disease, such as ossifications about the valves of the heart, and other impeding causes of circulation: ossification in the brain, or schirrosities therein. How will this apply in Hydrophobia? It will refer us to the fluids as a primary, to the solids only as a secondary cause, in tracing this complaint to its origin, and establishing a just pathology.

Vol. II. *page 3, line 4.*

“Disease divides itself into two stages.” Dr. Baumgarten^h chooses to divide the disease into two stages, but adopts very different periods from what I judge necessary. His first commences with the insertion of the virus, and ends with the commencement of the disease: his second, commencing here, ends with death. This indeed is an obvious division, but it tends to nothing useful, unless he had pointed out practical inferences, which he meant to convey by this distinction. He does indeed advise the destruction of the part bitten, but he does not seem to think it would be successful at any time throughout the first stage. This, if supported with proper proofs, would have been useful. All other prophylactics could avail nothing, howsoever diligently and attentively they might be prosecuted. This defect I have attempted to supply, and endeavoured, by examples to prove the utility of this practice, even at the commencement of the disease.

By

^h Vide Med. Comment, D. ii. vol. 4.

By dividing the disease itself into two *stages* the practitioner is enabled to form at least a more certain prognostic; and it is to the first part of this division I would more especially direct his attention. It does not appear to me impossible to arrest the disease during this period; but the practitioner must be quick in his determinations, and rapid in his execution. When Hydrophobia, or what I call the second stage begins, I perfectly agree with Dr. B.'s conclusion, that no cure has been performed, and I fear no cure can be performed.

Vol. II. *page 28, line 19.*

Since this sheet was printed I have perused Dr. Ferriar's Observations on a second case of Hydrophobia.¹ He inclines now to the doctrine of inflammation, considering the disease as bearing some analogy to peripneumonia. The dissection, in this case, he thinks, warrants the inference. The fluidity of the blood in this and other cases recorded, is referred by him to the same cause: hence V. S. blisters, with

¹ Vide Hist. and Reflections, vol. 3.

with mercury and opium present themselves, he thinks, as proper remedies.

Blood drawn from patients under active inflammation is more fluid indeed, and longer of coagulating than blood in a different condition; yet at length it does coagulate, and its texture is increased in firmness. Does it follow, that blood remaining fluid for 20 or 30 hours, or even for some days after death, must be inflammatory blood, and that the disease of the deceased was inflammatory? We are scarcely, I apprehend, warranted to draw this conclusion.

The dissection of a late eminent anatomist^k evidently shows the fluidity of blood from causes very different from inflammation. The history of this important case proved the disease to proceed from organic affections of the heart and its appendages. How far the blood might be altered from its healthy composition by interruptions to free circulation, I do not pretend to determine; but its fluidity would argue change. A review of that dissection, compared with the history of symptoms, will show
several

^k Vide Home's Life of J. Hunter, prefixed to his posthumous works, page 62.

several of the most important of them to be very analogous to those in Hydrophobia.

Hydro-carbonate gas possesses the property of keeping blood fluid¹ even after death. By this gas diseases of debility, not those of inflammation, are produced. Flaccidity of the heart follows from inhaling it.^m Blood is kept fluid by alkalies. Both ammonia and soda are present in the blood. An increase in their proportion may conduce to its fluidity.ⁿ

This appearance rather serves to point out the excess of hydro-carbonate in the blood, and a deficiency in the oxygene necessary for health. When the latter *abounds* we have heat, and greater *tendency* to inflammation: when it *super-abounds* it *induces* inflammation. Under this condition both the proportion of ammoniac and hydro-carbonate, perhaps also that of soda, are lessened. An inflamed eye is followed by an intolerance of light, but it differs widely from that intolerance to light, to white or to bright red, and transparent bodies, experienced in Hydrophobia. No shrinking from the contact of cold air presents in pneumonia, but it presents in some diseases
of

¹ Vide vol. 2, p. 86. ^m Ibid, p. 87. ⁿ Ibid, p. 94.

of an opposite kind : it is present in diseases of debility.

Narcotics have produced this sensibility to cold air ; so do some poisons. Inanition also has been productive of it. In the last days of a person who died from hunger, the increased acuteness of touch and vision were manifest.*

Are not these symptoms marks of debility, whether occurring in Hydrophobia, or under inanition ? Do such symptoms arise in pneumonic inflammation ?

In the case of Mr. J. Hunter, the sensations are morbidly acute, sight, smell, hearing, taste all are affected in an extreme degree ; yet nothing bearing a similitude to inflammation can be attributed to the disease. After the fit, wherein these and other symptoms were felt, had continued an hour or two, they would gradually yield, and the ordinary functions return. The illusions experienced here evince how much depends on the regular motion of the heart and blood, and how many nervous symptoms may be referred to its anomalous distribution. This case explains several of the appearances in hydrophobia. The
nerves

* Vide Currie's Med. Reports, &c. edit. 1, p. 224.

nerves indeed suffer yet not in a primary, but in a secondary manner.

A fever of a very malignant kind neither arising from contagion, nor propagated to others has been observed of late occasionally in England.^a Among other symptoms it is marked with great oppression at the precordia. It resembles Hydrophobia, not only in this, but in some other symptoms. It is accompanied with great quickness and impatience; volubility and rapidity in conversation. The patient is quick both in comprehending and answering questions; his sense of *hearing* and *taste* become morbidly acute; the reverse of which happens in the common typhus: his sensibility to cold air is also great; yet his heat measured at this time is no less than from 109° to 110° of Farenheit. Delirium considerable, but attended with intervals of calmness. The patient will rise from bed, dress, and insist on his being well. This the hydrophobic likewise does. This fever has never admitted of a cure in the instances hitherto observed, and the body runs speedily into putrefaction after death.

The

^a Vide Currie's Med. Reports, &c. edit. 1, p. 45.

The heat in hydrophobic patients, I believe, has never been measured in any more accurate manner than by contact of the hand. This omission, by observing physicians, will doubtless, when an opportunity offers, be supplied. I regret our want of this information.

Between these several diseases, this fever, that from inanition, as also those proceeding from narcotics (opium, hemlock, laurel water, &c.) and Hydrophobia, we may trace some similitude, a morbid condition of nerves beyond what is seen in other complaints. The analogy, distant as it is, deserves notice. It may lead to important discoveries.

Dr. F. adduces Nugent's case as an illustration; and as an instance of a *cure* by large and repeated V. S. Elizabeth Bryant, indeed, was bled on Saturday to fifteen ounces; next day to twenty ounces, and on Monday to twelve ounces. She recovered; but was her case Hydrophobia? A fortnight after recovery, an officious person frightened her. The same disease recurred; she was again bled; treated much as before, and again recovered. Agitation of mind from fear alone, both in the first and in the second instance seems to have induced *hysterical* convulsions, and all her other
symp-

symptoms. I wish Dr. Ferriar could have adduced a less exceptionable case in favour of V. S. as well as a proof of a cure in *rabid Hydrophobia*.

My plan would be to remove the debility existing by corroborants: he proposes to do the same by depletion. Till experiments decide the value of our respective modes, each may be allowed to retain his opinion. In many cases of true Hydrophobia V. S. has for ages been the practice. How unsuccessfully employed may be seen from the following examples, as well as hundreds more, on record.

Dr. Maclean's patient bled to 16 ounces.
Case I.

Mr. Raynbird's patient bled. Case II.

Mr. Freeman's patient bled to 6 oz. Case V.

Dr. Girdlestone's patient bled to 12 ounces.
Case VI. [VII.

Dr. White's 1st patient bled copiously. Case

Mr. Tufon's patient bled to 10 oz. Case XI.

Dr. Odhelius's patient bled to 7 ounces.
Case XV.

Mr. Dundas's patient bled. Case XXVII.

Mr. Babington's 1st patient bled to 20 oz.
Case XXXI.

—— 2nd bled to 14 oz. Vide p. 546.

Mr.

Mr. Bathie's patient bled. Case XXXVI.

Dr. Fothergill's patient bled to 6 ounces. Case XXXVII. [XXXVIII.

Dr. Vaughan's first patient bled. Case

Dr. Raymond's patient bled. Case XLIV.

Dr. Rutherford's patient bled to 66 ounces. Case XLVI.

Mr. Nourse's patient bled. Case XLVII.

Professor Plummer's patient bled. Case XLVIII.

Dr. Mead's 2nd patient bled. Case LI.

——— 3rd bled. Case LII.

Dr. Howman's patient bled to 7 ounces. Case LV.

Dr. Lister's patient bled. Case LVI.

Metzler's patient bled to 14 oz. page 533.

These I give only as a few unsuccessful cases of V. S. Had this procured relief it must have been discovered ages ago, and Hydrophobia, as well as pneumonic inflammation, which generally yields to a proper use of the lancet, ceased to be fatal.

Dr. Ferriar finds one of the lobes of the lungs in his patient stuffed with blood: hence his conclusion of the presence of inflammation in these parts. The venerable Boerhaave thought the same. That the blood is detained

in the centre, and does not reach the surface in due quantity is evident, from the pale colour of the external surface, and especially from the morbid sensibility and horror to the contact of cold air. Arterial blood produces heat wherever it goes, and in some ratio to its quantity. Contractions in the heart or great arteries will detain the blood in the pulmonary system: irregular action in this muscle will give rise to irregular distribution, and congestion must follow.^o Irregular action of the diaphragm, an organ greatly affected in this complaint, which may be induced by sympathy, or connection with the pericardium, may contribute to the same end. Such a case however of retention of the blood differs widely from inflammation. Remove the cause, or restore the heart to regular action, and the blood will resume its healthy course.

In the cold stage of an intermittent the blood does not reach the surface in proper quantity; it is retained near the centre; the heart, for a time, is deprived of power to repel it forwards, or spasmodic strictures exist in the smaller arteries depending on a debili-
tating

^o Vide vol. 1, p. 246. Vol. 2, p. 30. Ibid, p. 547, note.

tating cause. Would blood let during this struggle between the weakened power of the heart, and the resistance given to its passage by the distant collapsed arteries, shorten the cold stage, or remove it? Not V. S. but a very different practice is successfully followed. Should other cases of Hydrophobia happen in Dr. F.'s neighbourhood I trust, that the management will fall under his direction. I hope much from his sagacity. I have been instructed by his observations, and profess for his abilities great respect.

Vol. II. *page 41, line 4 from bottom.*

“Mercury acting on the habit produces irritation.” Dr. Ferriar, in conjunction with many respectable names, while he recommends V. S. for the cure of Hydrophobia, inculcates at the same time the use of mercury. If his theory of information be well founded, as far as mercury is antiphlogistic,^o it may perhaps be indicated. It has never been exhibited in Hydrophobia with this intention, but generally under the idea of a sialagogue, an alterative, a *specific*. The reasons which I have for rejecting it are given at some length
under

^o Vide Med. Comment. D. i. vol. 9, p. 191.

under their proper head;^a and I have nothing farther to add, but my readiness to yield to conviction the moment a case, where mercury has performed a cure, which can bear rational and unprejudiced examination, can be produced: till then I shall not remain in doubt only, but am persuaded of its inutility. Dr. F. will, I think, agree with me in condemning it as a *preventive* of a disease not existing. When the disease does exist, and it is thought expedient to exhibit it, the time necessary for its operation (I speak not of a cathartic) the rapid increase of symptoms, and speedy termination in death leave little room for well grounded hopes from its use. Does it cure either symptomatic or idiopathic tetanus? So far as violent muscular contraction, and nervous derangement exist, I admit the analogy between Hydrophobia and tetanus. I have too high a sense of this able physician's merits and candour to suppose that the freedom of my remarks will be considered by him in any other light than as those of a medical pathologist discussing doubts, and solicitous for truth; and though I cannot always coincide with him in the opinion either of the inflammatory nature of the disease,

ease,

^a Vide Prevention and Cure.

ease, or in the utility of mercury, I am far from being offended with him for adopting them.

Vol. II. *page 58, line last.*

“Doses of oil.” Oil, from the heat of the stomach, very soon grows rancid, and from its acrimony, must induce both vomiting and purging if taken in any considerable quantity.

Dr. ROXBARD.

Vol. II. *page 64, line 6 from bottom.*

“Without success.” A mad sow is said to have been cured by this remedy.^p The creature was seized, we are told, with the disease on the 6th day after the bite. Being shut up immediately on being bitten, an opportunity was afforded for observation. The first symptom was refusal to eat. She stood for three days with her head leaning on her food, without eating it. M. Beudon directed four pots of strong warm vinegar to be let down through a hole in the stable where the creature stood; then stopped up the hole to prevent communication with the external air. About an hour after

^p Vide Ferriar's Hist. and Reflections, vol. 3, p. 19.

after she was observed to drink the vinegar with the greatest avidity. This induced him to put a quantity of bran moistened with vinegar into her trough; it was all consumed by the following day. The plan was pursued, and the animal, it is said, recovered. Two dogs bitten with the sow were cured by the same means.

This experiment must be more than once repeated before it can establish the efficacy of vinegar as a cure.

Vol. II. page 70, 71.

“Opium useless in the largest doses yet given.” To the instances here related to support this assertion may be added the large quantity given in a recent case (published since this was printed) communicated to the public by Dr. Babington.^b 180 grains were exhibited in 12 hours in vain.

A second case by Dr. Wavell affords another instance to support the same conclusion.

Vol.

^a Vide Med. Records and Researches, selected from the Papers of a Private Association.

Vol. II. *page 91, line 2 from bottom.*

“Iron in a greater proportion.” The red colour of blood has generally been attributed to the presence of iron. Cavallo doubts the truth of this opinion;^r but Dr. Wells seems to have put the subject beyond farther dispute, confirming by well-conducted experiments this philosopher’s doubts.^s The conclusion appears at first view to have been hasty, that because iron existed in this part of the blood the red colour must depend on it. Bones and wood contain iron, yet no redness is imparted. Minium again is red, yet it contains no iron. To the particular modifications of light passing through different media, or meeting with bodies of different capacities (Dr. W. thinks) this colour is to be ascribed. If you expose blood in a close vessel, to a heat less than 112°, its red colour will be lost, and cannot again be restored: but no metal, in a degree of heat
under

^r Vide Essay on Factitious Airs.

^s Vide Phil. Transf. part ii, for 1797. Experiments by Dr. Wells.

under the boiling point, loses its colour. If the colour of other bodies be destroyed by acids or alkalies, these will again restore them: no method can restore the red colour of the blood when once destroyed by acids or alkalies.

Vol. II. page 140, line 17.

“ Followed in our own country.” The practice still unhappily continues; for even about three weeks ago an unfortunate patient, at Southmoulton in Devonshire, through the same mistaken notions suffered. “ The malady increased so rapidly, that it became necessary to give him his *last sleep*.”^t

This man, whose name was Baker, had been bitten by a mad dog about three months before, and the wound, at the time, was *cauterized*; a proof of the doubts which were suggested in their proper place, relative to the efficacy of this preventive mode.^u

Vol. II. page 160, line 31.

“ Eighth, ninth, and thirteenth.” It is in the ninth book, line 239, where the word *lyssa*,
or

^t Vide Lond. Chron. for Aug. 2, 1798.

^u Vide vol. I, p. 139.

or *lytta* is used, which has been translated *rabies*, and applied to the dog; but it appears of little moment whether it be interpreted *madness* of a dog, or *rage* and fury of this animal, for the reasons given in the text. The word however is original, not derived. Hederic. Lexicon, word *luffa*.

Vol. II. page 162, line 7.

“Unknown to the same regions in former ages.” Sixty years ago pleurifies were very frequent in this county, during the months of Jan. and Feb. but now are seldom known, owing to the use of a very different diet.

Dr. ROXBARD.

Vol. II. page 165, line 13.

“Scarlatina.” The frequency of this fever in Ipswich has enabled me to trace it on several occasions, I think, to its source, to the family where the infection originated. I have minutely inquired, whether they knew how the disease came; whether they had any intercourse with persons ill of it, and have been positively assured they had not. At this time it
was

was unknown in the neighbourhood. To trace it in the country is still less difficult; the intercourse with people is less. I have found it in a family in the country, and they knew not how it came. It has proved severe, and even fatal, and then was extinguished, luckily without extending to others. From an experiment of Dr. Currie we have reason to believe, that this malady may be as much under our controul as the small pox, and by means nearly similar, the application of cold. The fever, Dr. C. is led to think, gives rise to, and regulates the quantity of efflorescence. Nip the fever early in the bud, and the efflorescence, as well as the affection of the throat, will be prevented. The scarlet eruption will either be none, or very moderate. This is to be done, he thinks, principally by the affusion of cold water.^v

Vol. II. *page 167, line 6.*

“ Old variolous matter.” Two months and upwards, after the printing of this passage, Dr. Currie’s Medical Reports came, for the first time,

^v Vide Currie’s Med. Reports, &c. edit. 1, p. 62.

time, into my hands, where I find with pleasure, the sentiment suggested here confirmed by his experience.

“ On Feb. 2, 1792, I took a considerable quantity of this matter on a piece of window glass, keeping it as much together as its fluidity would admit. It was exposed immediately to a stream of air, and the surface was speedily dry. On March 2 following, after moistening a portion of it with a little water, I inoculated three patients, and all with success. In the course of the summer I inoculated with another portion of it, previously liquified by the addition of warm water, and with success as before. On the 20th of July, 1793, I again used a portion of the same matter in the same way, and again with success; but this success was long doubtful, and it was not till the twenty-second day after the operation, that the patient sickened. I used the same matter in June, 1794, when it entirely failed me. It is now by me and is not mouldy, nor any ways changed in its appearance. Variolous matter kept sometime is certainly slower in producing the disease, even where it does succeed in the end.”^w

Vol.

^w Vid Med. Reports, &c edit. 1. page 59. note.

Vol. II. *page. 172, line 6 from bottom of note.*

“ Twenty-five of the oxygene to to about seventy-five of azote.” Atmospheric air examined both synthetically and analytically by Lavoisier is found to consist of twenty-seven parts of oxegene and seventy-three of azote.*

Vol. II. *page 203, line 10.*

“ Without any communication.” Respecting situation it was very remarkable in Ipswich, that in July 1764, after some very hot days, a cold easterly wind brought on a dysentery which affected almost every person in those streets, which had a direction from east to west.

Dr. RODBARD.

* Vide Elements of Chemistry.

ERRATA.

E R R A T A.

Vol. 1, p. 273, line 3, after *is* dele more; after *frequent* dele than in our island.

VOL. II.

Page. Line.

- 2—10, for *have* read *has*.
- 5—3, for *porracious* read *porraceous*.
- 9—2 from bottom, for *mucus* read *mucous*.
- 14, for *loose* read *lose*.
- 15—4 from bottom, for *and even* read *even with*.
- 20—14, for *chrystalized* read *crystallized*.
- 22—last, for *dissolve* read *dissolve*.
- 23—note, read *Satius est enim anceps auxilium experiri, quam nullum. Cels. lib. 2, cap. x.*
- 24—4, for *their* read *the*.
- 26—last, for *trod* read *trodden*.
- 33—for *Rubijacients* read *Rubefacients*—*passim*.
- 41—2, after *of* dele it.
- 46—19, for *juventia* read *juvantia*.
- 47—note, for *lectures* read *lecture*.
- 52—note, for *Simms* read *Sims*.
- 55—note, for *Simms* read *Sims*.
- 63—6 from bottom, for *in* read *over*.
- 72—last, note, for *wants* read *we want*.
- 85—5, for *hybro-carbonate* read *hydro-carbonate*.
- 110—last, note, after *manganese* dele *to subside*.
- 147—16, for *practises* read *practices*.
- 180—9, for *practise* read *practice*.
- 186—3 from bottom, for *commixion* read *commixtion*.
- 188—7, for *these* read *those*.
- 17, for *concomitant* read *concomitant*.
- 189—4, for *infection* read *infection*.
- 191—4 note, for *towards* read *to*.
- 192—8 from bottom, for *shall* read *should*.
- 193—4 from bottom, after *coldest* read *day*.
- 205—3, for *would* read *should*.
- 206—1, for *equal* read *equally*.
- 3, for *and* read *or*.
- 7, for *rotine* read *routine*.
- 212—1, for *ere* read *there*.
- 215—8, for *was* read *is*.

Page Line

- 228—8, for *it* read he.
 9, for *its* read his.
 10, for *its* read his.
 13, for *its* read his.
- 231—2, for *dog's* read dogs.
- 235—last, after *more* read easily.
- 241—14, after *in* read his.
- 243—3, after *them* read as.
- 253—4, for *cerous* read ferous. [ple
- 260—8 from bottom, after *are* read by many mistaken peo-
- 265—4, for *generally* read for the most part.
- 267—2, after *denomi* add a hyphen.
- 296—14, after *reflections* dele (,) for *and* read an.
- 297—11, after *but* read of.
- 314—last, for *fighing* read fighting.
- 317—4 from bottom, after *clergy* read were.
- 324—4, for *tendenous* read tendinous.
- 338—1, for *sprightfulness* read sprightliness.
- 347—9, after *glafs* read of.
- 360—14, after *her* read to.
- 418—2, for *turigd* read turgid.
- 432—3, for *odematus* read œdematous.
- 459—7, for *pedilurium* read pediluvium.
- 495—7, for *chariti* read charity.
- 500—19, for *sphacellation* read sphacelation.
- 515—8, for *exciffion* read excision.
- 523—1, for *should* read would.
- 532—15, for *increased* read difficult.
- 534—note, for *of propagating* read to propagate:
- 535—3, for *seldomer* read less frequently.
 3 from bottom, for *stock* read drove.
- 539—12, for *Pareus* read Parè
 16, for *Heroditus* read Herodotus.
 26, for *Joam* read Joan.
- 540—2, for *Valenianus* read Valerianus.
 10, for *Amatus Lautonus* read Aichholtzius.
 19, for *Greviorus* read Grevinus.
 21, for *Anamal.* read Animal.
- 550—3 note, for *active* read the display of great.
- 553—9, for *irascible* read irascible.
- 555—6, for *which* read whom.
 ii—10, for *leison* read lehon.
 iv—12, for *Cicily* read Sicily.
- xviii—4, for *propogated* read propagated.
 7, for *precordia* read præcordia.

